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ABSTRACT

This implementation guide is intended to assist the teacher and curriculum specialist in developing instructional materials that are competency-based and meet competency-based education (CBE) standards and requirements for vocational and adult programs. Section I, Career Decision-Making Information, includes information related to career exploration, planning, and preparation. It addresses guidance services/resources, occupational options, occupational and educational information, and using the Virginia Vital Information Education Workshops (VIEW) Microfiche Deck to obtain occupational information. Section II, Student Organizations, provides information related to the role of student organizations in vocational education and specific activities of the American Industrial Arts Student Association. Section III, Classroom Management Systems, illustrates several samples of classroom management systems developed by teachers who incorporated competency-based vocational education techniques into their courses and programs. These systems are discussed: instructional unit plans for CBE, lessons plans, student project activity sheets, learning contracts, self-contained learning systems, and a personnel management system. Section IV, Recording Systems, contains information on the characteristics of grading and recording systems for CBE. This information is followed by sample recording system forms that may be reproduced for use by the classroom teacher. (YLB)

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Industrial Arts Guide to CBE Implementation

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Richmond, Virginia 23216

1984

COMPETENCY-BASED CBE EDUCATION

Review Draft

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INDUSTRIAL ARTS

GUIDE TO

CBE IMPLEMENTATION

Developed by

Virginia Vocational Curriculum Center
Henrico County Public Schools
Department of Vocational and Community Education
Glen Allen, Virginia 23060

In cooperation with

Industrial Arts Education Service
Divisions of Vocational and Adult Education
Virginia Department of Education
Richmond, Virginia 23216

1984

FOREWORD

In the next decade, businesses and industries in Virginia will require large numbers of skilled workers. Therefore, vocational education at the secondary and postsecondary levels will have the responsibility of preparing individuals for a variety of occupations.

Competency-based education (CBE) provides the preparation students need for entry into the Virginia work force. The CBE practice of recording competencies developed by students helps them to make a smooth transition between secondary and postsecondary programs when both levels of education are required for career training. In addition, CBE is effective in retraining workers who have been displaced because of changing technology.

This resource will assist teachers and administrators in developing instructional materials that meet the needs of students and industry and comply with the Virginia CBE standards for vocational and adult education.

S. John Davis
Superintendent of Public Instruction

Melvin H. Garner
Administrative Director
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Special recognition is given to the students of the Henrico Trade Center of the Henrico County Public Schools, Department of Vocational and Community Education. Under the supervision of William D. Burton, printing instructor, these students printed, assembled, packaged, and prepared the guide for distribution.

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CONTENTS

Page

INTRODUCTION

CBE Standards and Requirements 1
Purpose 2
Organization 2
Terminology 5
How to Use Industrial Arts Guide to CBE Implementation and the Instructional Task/Competencies Package 8

SECTION I. CAREER DECISION-MAKING INFORMATION

General Information 11
Career Orientation and Exploration 13
Guidance Services/Resources 14
Career Planning and Articulation 14
Occupational Options 15
Career Preparation 16
Occupational and Educational Information 17
Career Clusters and Occupational Titles 19
Using Virginia VIEW to Obtain Occupational Information 20
Cluster 1. Communication 23
Cluster 2. Construction 29
Cluster 3. Manufacturing 35
Cluster 4. Transportation 43

SECTION II. STUDENT ORGANIZATIONS

General Information 47
Competency Development through AIASA 49

SECTION III. CLASSROOM MANAGEMENT SYSTEMS

General Information 55
Instructional Unit Plans for CBE 57
Planning Form 59
Lesson Plans 61
Framework Sample 64
Lesson Plan Sample 65
Lesson Plan Form 67
Student Project Activity Sheets 69
Project Plan Form 70
Learning Contracts 73
Learning Contract Form 75
Self-Contained Learning Systems 77
Learning Activity Package Sample 81
Personnel Management System 85

SECTION IV. RECORDING SYSTEMS

General Information 91
Grading 91
Characteristics of Grading Systems for CBE 92
Psychomotor Grading 93
Grading System Including Affective, Cognitive, and Psychomotor Abilities 94
Characteristics of Recording Systems for CBE 94
Individual Student Record Samples 95
Vocational Education Competency Record 97
Recording System (An Example Suggested by Virginia Industrial Arts Service). 101
Format for Typing a Recording Form 103
Computerized Student Profile 105

BIBLIOGRAPHY 107

INTRODUCTION

This Industrial Arts guide has been developed as part of a statewide effort to implement competency-based education (CBE) in state vocational programs. The development of this guide and the total implementation effort are based on the 1978-79 Virginia State Plan for Vocational Education which contains the following objectives:

> By June 30, 1982, each school division shall have implemented competency-based instruction in approved vocational education programs based on V-TECS and IDECC catalogues, if available, or other competency-based materials as reported in the annual Local Evaluation Programs, and each community college shall have implemented competency-based instruction in at least one program based on V-TECS materials as reported by the Virginia Community College System.

Although 1982 is designated in the above objective, the date has been extended and full implementation of competency-based education now is planned for 1984.

In addition to this state plan objective and previous efforts by state educators to implement CBE, the Virginia Department of Education has adopted the following CBE standards and requirements for vocational programs:

Standard I. ROLE-RELEVANT COMPETENCIES ARE IDENTIFIED AND STATED.

Requires:
- A. A validated task/competency list for each vocational program
- B. A performance objective for each validated task/competency

Standard II. COMPETENCIES ARE SPECIFIED TO STUDENTS PRIOR TO INSTRUCTION.

Requires: A system for providing task/competency information to students prior to instruction

Standard III. CRITERION-REFERENCED MEASURES ARE USED TO MEASURE ACHIEVEMENT OF COMPETENCIES.

Requires:

A. A criterion-referenced measure for each validated task/competency

B. A testing and evaluation procedure which tests the performance objective and is criterion-based

Standard IV. A SYSTEM EXISTS FOR DOCUMENTING THE COMPETENCIES ACHIEVED BY EACH STUDENT.

Requires: A system that has task/competency records/profiles for student achievement in each vocational program, course, or unit.

The materials in this implementation guide are designed to complement the instructional task/competencies package for each Industrial Arts course in order to comply with the state CBE standards and requirements for vocational and adult programs.

Purpose

The primary purpose of this implementation guide is to assist the teacher and curriculum specialist in developing instructional materials which are competency-based and meet CBE standards and requirements for vocational and adult programs. It may be used to update vocational programs currently being offered. The materials contained in this guide are designed for planning by instructional personnel, rather than for direct use by the students.

Organization

This guide is divided into the following sections:

I. Career Decision-Making Information

Information related to career exploration, planning, and preparation is included in this section. The information is useful in helping students select careers related to the course and in encouraging them to further investigate career interests.

II. Student Organizations

Information related to the role of student organizations in vocational education and the specific activities of the American Industrial Arts Student Association (AIASA) is provided in Section II.

III. Classroom Management Systems

Several sample classroom management and delivery systems have been included in this section. The systems have been field-tested and are intended to assist the teacher in using competency-based materials in the classroom and laboratory.

IV. Recording Systems

Recordkeeping systems have been developed to assist the teacher in documenting successful student achievement of competencies. This section contains sample recording system forms which may be reproduced for use by the classroom teacher.

An instructional task/competencies package is available for each course in Industrial Arts Education. Each task/competencies package contains the following information:

Part 1. Programs and Courses

This section contains a description of the Industrial Arts Program and a description, instructional task list, and content outline for the specific course. The task list includes all task/competencies identified for inclusion in the course, and tasks are listed in a suggested order of instruction. The content outline corresponds with the task list in content and sequencing. However, within the outline, tasks are identified in topical form, and related tasks are grouped into broader topics of instruction.

Part 2. Task Inventory

This section contains information for instruction in each of the task/competencies identified in Section 1. In order to facilitate referral to a desired task, the task/competencies in this section proceed in a numerical, rather than instructional, order. The following information is provided for each task/competency: appropriate program and course designation, performance and enabling objectives, a criterion-referenced measure, and suggested activities and aids for task instruction.

When the instructional task/competencies package is used in conjunction with the relevant career information in Section I and the material in Sections II, III, and IV of the Industrial Arts Guide to CBE Implementation, a complete instructional resource guide is available for implementing competency-based instruction in the given Industrial Arts course.

Terminology

ARTICULATION: A planned process within an educational system that coordinates instructional programs which will enable students to move from one instructional level to another or from one institution to another at the same instructional level without unnecessary duplication or gaps in the instructional program.

CAREER (OR OCCUPATIONAL) CLUSTER: One of the 15 groups of related jobs and careers, as identified by the U.S. Department of Education. Careers within the Communication, Construction, Manufacturing, and Transportation clusters are studied through the Industrial Arts curriculum.

CHECKLIST: A list of activities or behaviors that are checked by a student, teacher, or observer as being completed during a particular observation session; frequently used to assess student performance in the psychomotor and affective domains of learning.

COMPETENCY: Demonstrated ability (including knowledge, skills, or attitudes) to perform a specific task successfully in order to meet a specified standard.

COMPETENCY-BASED EDUCATION (CBE): Educational programs in which required knowledge, skills, and attitudes are based on role-relevant competencies.

COMPETENCY-BASED EDUCATION STANDARDS: Standards for CBE in Virginia: (1) role-relevant competencies are identified and stated; (2) competencies are specified to students prior to instruction; (3) criterion-referenced measures are used to measure achievement of competencies; and (4) a system exists for documenting the competencies achieved by each student.

COMPETENCY RECORD/PROFILE: A document that provides specific information concerning student achievement of competencies in CBE courses or programs, including the following information: student name, program title, listing of all terminal competencies, enabling competencies (if required), rating scale, and method for authenticating the record.

CONTENT/CONCEPT: A distinct grouping of tasks which are related to each other by the nature of the activity performed.

CRITERION (criteria): The standard(s) required for a student to reach mastery of an objective.

CRITERION-REFERENCED MEASURE (CRM): A test, test item, or a statement which describes how a student will be tested and/or evaluated. The CRM is based on the task/competency standard or criterion. Criterion-referenced measures may include the standard or criterion as illustrated in the following examples:

Examples: Psychomotor

Plane pieces of short stock and thin stock to the uniform thickness set by the instructor.

Cognitive

Identify nine out of ten English and metric terms related to measuring and layout on a written test.

Affective

Exhibit positive attitudes in the vocational classroom and laboratory. Your attitudes will be evaluated by the Program Attitude Checklist.

CRITERION-REFERENCED TESTING: A process of testing which yields measurements that are directly interpretable in terms of specified performance standards. An individual's performance is compared to a criterion, the criterion being the work or performance standard. Therefore, criterion-referenced testing is based on absolute standards stemming from the competency, rather than relative standards, such as class standing (also called criterion-referenced evaluation, objective-referenced testing, proficiency testing, or domain-referenced testing).

CURRICULUM: Objectives, content, and learning activities arranged in a learning sequence for a particular instructional area. An orderly arrangement of integrated topics, activities, and experiences which students pursue for the attainment of a specified educational goal.

ENABLING OBJECTIVE: An objective that identifies one thing a learner must be able to know or to do to complete the performance objective.

ENTRY-LEVEL SKILLS: The set of competencies required of a beginning worker in an occupation for immediate productivity upon entering that occupation.

JOB/OCCUPATION: The composite of duties and tasks performed regularly in one's trade, occupation, or profession.

INSTRUCTIONAL ACTIVITIES: Educational activities completed by the students to learn specific competencies (also called learning strategies).

OCCUPATIONAL DOMAIN: A group or listing of occupations within a vocational area that share common experiences, knowledge, and skill requirements, such as manufacturing occupations and construction occupations.

PERFORMANCE: A clear statement of what the learner will be able to do after mastery status has been obtained.

PERFORMANCE OBJECTIVE: A statement in precise measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified as follows:

a. Condition--The performance situation confronting the learner is clearly specified. This specification includes equipment provided or withheld and environment constraints such as temperature and space.

b. Performance--The specific behavior expected of the learner is stated.

c. Standard (criterion)--The degree of acceptable performance is specified. This may be quantitative, qualitative, or both. If quantitative, 100% proficiency is assumed unless otherwise stated. In the standard, ". . . identify types adhesives used in woodworking," it is assumed that all adhesives must be identified, compared to, ". . . identify five of six adhesives used in woodworking." If qualitative, the standard is explicitly stated, e.g., ". . . calculate the board feet to within 2 board feet of that calculated by the instructor."

STANDARD: That part of a performance objective or criterion-referenced measure which describes how well or to what proficiency level a task must be performed (also called performance level, criterion, or work standard).

TASK: The knowledge, skills, or attitudes that the learner should possess after completing instruction in the Industrial Arts lesson or class.

TASK ANALYSIS: An organized method for identifying roles, responsibilities, and jobs performed by workers in an occupation or content in non-occupational courses. Task analyses are used in CBE to establish instructional content and scope.

TASK LIST (OR INVENTORY): A list of tasks performed by workers in an occupational domain (also called job inventory) or what is required to be taught in a course.

VALIDATION: A procedure used to determine and verify if tasks/competencies identified for a vocational program are valid.

WORK MODES: The six ways or styles of performing work, as identified by John Holland, that are designed to aid students in making future educational and career choices which are compatible with personal characteristics and interests.

HOW TO USE THE INDUSTRIAL ARTS GUIDE TO CBE IMPLEMENTATION AND THE INSTRUCTIONAL TASK/COMPETENCIES PACKAGE

The following steps should be followed when using this guide and the appropriate instructional task/competencies package in order to implement competency-based instruction in an Industrial Arts course:

Using the Task/Competencies Package

STEP 1: Review the task sequence list and course outline included in Part 1. If additional task/competencies are identified or if changes in the instructional sequencing of task/competencies is desired, revise the sequence list and course outline accordingly.

STEP 2: Review the task inventory included in Part 2. If additional tasks were identified in Step 1 above, insert those tasks, with accompanying information, within the appropriate content/concept area.

STEP 3: Develop lesson plans and prepare instructional materials for each task/competency. Proceeding in the sequence identified in Part 1, plan for instruction in each task by reviewing the objectives, suggested activities, and instructional materials identified on the appropriate task/competency sheet in Part 2. Secure or develop needed instructional materials, such as student handouts, learning activity packages, modules, lab exercise sheets, or audiovisual materials. Include any additional instructional activities or materials as they relate to the given task identified for instruction.

STEP 4: Develop criterion-referenced measure for each task. Construct or secure criterion-referenced test, or other assessment tool noted, using the criterion-referenced measure information on the appropriate task/competency sheet in Part 2.

Using This Guide

STEP 5: Select a classroom management system. Select a classroom management (or instructional delivery) system from Section III, modifying as necessary to meet local or individual requirements. Review Section II information for integration of student organization activities in the classroom.

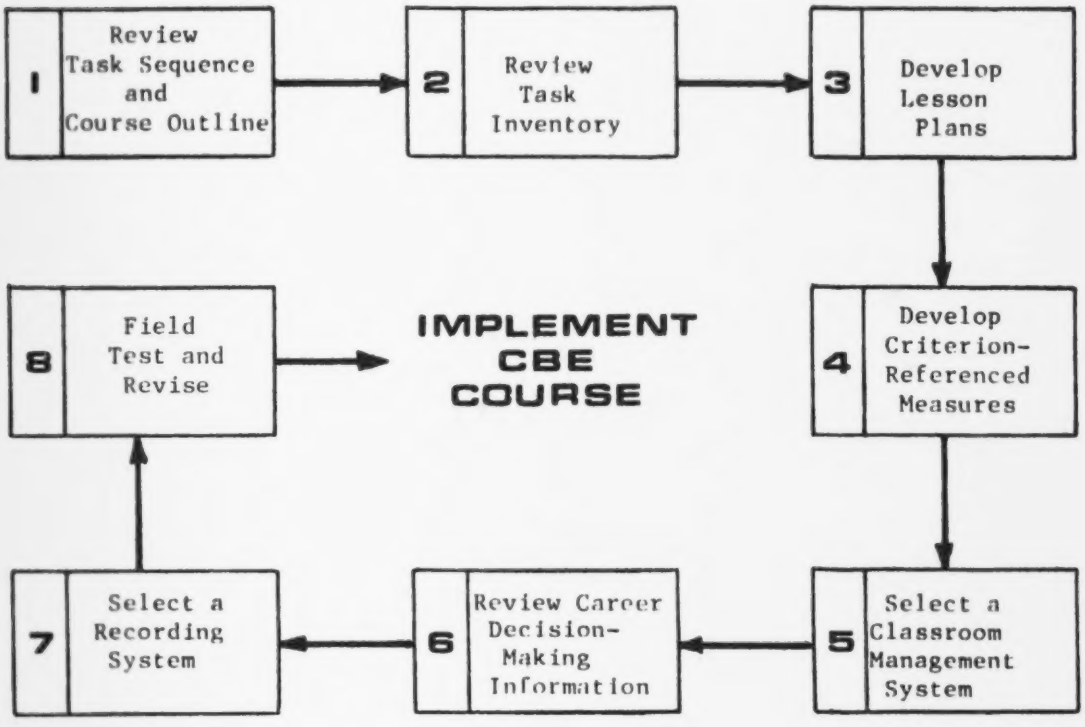
STEP 6: Review career decision-making information. Extract that information from Section I that is applicable to the course. Integrate the information into career orientation and exploration activities throughout the course, thereby aiding students in making career decisions and in selecting appropriate educational and vocational courses. Use assistance from guidance personnel in the instructional program for career counseling.

STEP 7: Select a recording system. Review the recordkeeping information and samples included in Section IV. Design or select a student recording system according to local program requirements or administrative procedures.

Field Testing

STEP 8: Field test and revise developed activities, materials, and systems. This is the final step prior to full program implementation.

The use of the Industrial Arts Guide to CBE Implementation in conjunction with the task/competencies related to a given Industrial Arts course is illustrated by the following diagram. Steps 5, 6, and 7 require use of this guide, while information needed for completion of steps 1, 2, 3, and 4 is found within the individual task/competencies package.



The preceding procedure for implementation of competency-based education in Industrial Arts programs and courses may be modified to meet local program requirements and needs. Materials and information in addition to those included in this guide or the instructional task/competencies package may be necessary or desired. Further information concerning the implementation of competency-based education is provided in the Guide for Implementing Competency-Based Education in Vocational Programs, Virginia Department of Education.

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[1] Ralph A. Horne, Guide for Implementing Competency-Based Education in Vocational Programs, Field Review Draft (Richmond: Virginia Department of Education, 1981).

SECTION I.

CAREER DECISION MAKING INFORMATION

The Industrial Arts Program plays an important role in the broad mission of vocational education by acquainting students with the world of work and providing them with exploratory or fundamental experiences in certain clusters of careers. Students need a broad base of tryout experiences and insights into available career opportunities in order to build a sufficient framework of awareness from which they might conduct personal assessments of work interests and aptitudes. Opportunities for expanding this base of awareness occur early in course offerings at the secondary level, in time to assist the guidance function. The mixture of guidance, awareness, exploration, and preparation is aimed at improved quality and relevancy in career preparation and placement. As a result, the individual is aided in assuming a more productive and fulfilling role in society.

The contributions of the early secondary level courses to the goals implied in the mission of vocational education involve three very important aspects, without which meaningful occupational preparation would be impossible. These three aspects include: an awareness of self, an awareness of the technological culture in which the individual lives, and the development of the fundamental skills contributing to the performance of an individual in contemporary society.

Awareness of Self: One's selection of work or occupation must logically start with as full an understanding as is possible of one's self. In making career decisions, the individual might ask:

What are my interests, ambitions, and goals?

What are my strengths and weaknesses?

What type of activities and experiences are compatible with my emotional and physiological makeup?

Do I enjoy working with others?

What do I want to do with my life?

Technological Awareness: As the culture has become distinctly and uniquely technologically dominated, it has become impossible to separate self-awareness and technological awareness. An insight into and understanding of technology and its meaning, origin, nature, development, impact, and consequence for society are imperative for all individuals, regardless of their educational goals or occupational pursuits.

Fundamental Skills: Fundamental skills are those skills as basic to occupations and careers as are the three R's to elementary education. These skills are identified as: communication skills (making presentations, interpreting drawings, developing directions, directing others, planning with others); manual skills (constructing objects, making drawings, testing materials and processes); social interaction skills (meeting with others, leading others, following others, cooperating with others); and problem solving skills (developing inquiry capabilities, developing resourcefulness, developing evaluation capability).

CAREER ORIENTATION AND EXPLORATION

One of the first activities in career exploration is one in which students identify the wide variety of careers they will experience in the course. Student experiences allow exploration into several "work modes." Work modes is a term referring to the six ways or styles in which people perform work. As students experience various laboratory activities, they determine if the style of work performed in a given job is truly suitable in terms of their personal interests and abilities. The following description of worker characteristics compatible with each of the six "work modes" will aid students in making career decisions and future educational choices which are appropriate in light of personal interests:

(1) Mechanical Work Mode: people with good coordination who like to work with tools and machines and who enjoy seeing the fruits of their labor.

(2) Conventional Work Mode: people who enjoy short-term repetitive tasks and can work well alone, following a routine.

(3) Enterprising Work Mode: people who like to manage and persuade others.

(4) Creative Work Mode: imaginative, expressive people who work well by themselves.

(5) Social Work Mode: sociable, humanistic people who enjoy helping and working with people.

(6) Investigative Work Mode: people who like to analyze things and plan ahead, and who also work well with fewer numbers of people.

Students use these work modes as a framework through which they can tentatively judge the suitability of any occupation to their own personality characteristics. The concept of appropriate career choice is further realized through exploratory experiences directly related to current practices in industry.

GUIDANCE SERVICES/RESOURCES

There is a clear relationship between the Industrial Arts Program and guidance resources available in the school. Through the use of interest inventories and aptitude surveys, guidance personnel help students assess themselves and become aware of their special talents. Career information, available in most guidance offices, includes information related to specific occupations, working conditions, and current trends in the world of work. Students are encouraged to use the Occupational Outlook Handbook in their exploration activities and to see their teacher and guidance personnel for help in locating other literature related to their career interests. Guidance and counseling for students in Industrial Arts assists them in making informed and meaningful choices in their selection of occupational fields or advanced vocational programs.

CAREER PLANNING AND ARTICULATION

The activities of Industrial Arts help students clarify their career goals. Many aspects of one's personality and interests can be explored in relation to the technical or work styles of careers introduced. Students are encouraged to talk about their personal goals and interests. Other useful planning information may be obtained through investigating financial considerations, career alternatives, and pre-employment experiences in each individual student situation. Career planning is a concluding activity in which the student makes career choices based upon all of these considerations and selects the next course leading to a chosen career interest.

Teachers will be able to help interested students plan and identify steps leading to career choice by arranging tours of vocational centers and acquainting them with programs and courses.

Allowing students to observe other students, to meet teachers in such programs, and to interview successful people in the work force aids students in making a smooth transition to the next level of instruction.

OCCUPATIONAL OPTIONS

For each Industrial Arts course, there is a great range of occupational options. Almost every occupation includes several titles for workers in that field. Career planning and pursuit should involve opportunities for advancement into these other options for the person who attains special talents or additional training. Workers in all fields should make every effort to enroll in continuing or adult education. This can usually be pursued through evening course attendance provided by the community college or through courses sponsored by corporations. Such Industrial Arts course offerings might involve the technical categories of construction, manufacturing, communications, or transportation. These experiences may lead into advanced technical preparation programs or they may create interest in further exploration of other technical areas, such as woods, graphics, mechanical drawing, metals, and electronics or power.

CAREER PREPARATION

The following outcomes of the Industrial Arts Program are helpful to students in their preparation for a successful and rewarding career:

Technical adaptability is promoted through preparing students for living and working in a technological world where there is a common need for adaptability and employability of skills. Many of these abilities are enhanced by Industrial Arts programs which include a student organization.

Pride in work is learned as students build models and projects that have self-gratifying value and create feelings of worth. Recognition is provided through AIASA to students who complete work and participate.

Positive attitudes toward work are increased through laboratory activities that illustrate the need for and benefit of work in regard to both the individual and society. Positive attitudes are enchanced through AIASA activities which allow students to meet workers from industry.

Following directions is practiced as students proceed toward completion of individual or group projects.

Abilities to solve problems are developed as students use technology to design and develop items useful to them or other people.

Safe work practices are learned before tools are used. These skills are transferred to the care and use of machines and other equipment.

Cooperative attitudes result from seminars wherein students share and receive help with projects and from group activities in AIASA.

OCCUPATIONAL AND EDUCATIONAL INFORMATION

Teachers and counselors are encouraged to use the Dictionary of Occupational Titles[2] and the Occupational Outlook Handbook[3] when presenting information to students.

It may be helpful to duplicate occupational information for students to use in making comparisons within a selected field of study. This material may be useful also in preparatory courses to aid in course selection and goal setting.

Career information can be studied for comparisons concerning such factors as earnings, training needed, and occupational growth. Categories of occupational information available in most resources are as follows:

PLACES OF EMPLOYMENT: Includes the number of workers in a given occupation; a listing of the places with a description of numbers (most, many, some) of the places of employment; the areas of concentration, geographically or industrially; and the number of self-employed persons.

WORKING CONDITIONS: Lists the conditions common to different occupations, overtime work, environment, hazards, and outdoor/indoor occupations.

PREPARATION/TRAINING: Identifies the types of training required or preferred and where such training is available. (Note: Entry level jobs are most often found in office and service clusters, but some are found in sales, mechanical, and industrial clusters. The level at which a person enters an occupation and the speed at which the person advances frequently are determined by the amount of training completed by the individual.)

OTHER QUALIFICATIONS: Includes physical requirements, personality traits, aptitudes, and attitudes.

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[2]U.S. Department of Labor, Employment and Training Administration, Dictionary of Occupational Titles (4th ed.; Washington: U.S. Government Printing Office, 1977).

[3]U.S. Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook (1980-81 ed.; Washington: U.S. Government Printing Office, 1980).

ADVANCEMENT: Summarizes the possibilities that exist with and without additional training; career ladder progression; patterns of movement from one occupation to another, if available; occupations which require little or no previous work experience; opportunities to transfer to other work of a similar nature; and licensing or certification requirements. (Note: Occupational skills gained in one job can make the worker more employable in another--perhaps a job that is more desirable in terms of earnings, working conditions, or scope for self-expression.)

WORKER FUNCTIONS/RELATIONSHIPS: Refers to the middle three digits in the DOT Code, the ratings or the worker functions entailed in the particular job. (Note: The higher the number assigned, the less complex the function; conversely, the lower the number asigned, the more complex the level of responsibility and judgment required.)

SPECIALIZED TITLES: Refers to those that require similar aptitudes, interests, and education or training.

RELATED OCCUPATIONS: Refers to those that require similar aptitudes, interests, and education or training; for example, occupations related to computer operating personnel include the specialized titles noted above.

NATURE OF THE WORK: Describes the major duties of workers in the occupation or industry, what the workers do on the job, what tools and equipment they use, and how they do their work.

EMPLOYMENT OUTLOOK: Presents data as follows:

PROJECTED CHANGE IN EMPLOYMENT REQUIREMENTS

_____Much faster than average	50.0 percent or more
_____Faster than average	25.0 to 49.9 percent
_____About as fast as average	15.0 to 24.9 percent
_____More slowly than average	5.0 to 14.9 percent
_____Little change	4.9 to -4.9 percent
_____Decline	-5.0 percent or more

EARNINGS: Includes items such as salary/wages, nightshifts, irregular hours, tips, and differences in earnings within given occupations. (Note: Generally, earnings are compared to the average earnings of workers in private industry who are not supervisors and not in farming. This group represented about 60 percent of all workers in 1978. Salaries may vary according to geographic location, type of industry, and type of work performed.)

BENEFITS: Contains an overall listing of benefits available; however, advantages not listed also may be available.

For further information concerning occupational information, write:

Executive Director of VOICC
(Virginia Occupational Information Coordinating Committee)
Virginia Employment Commission
P.O. Box 1358
Richmond, Virginia 23211

CAREER CLUSTERS AND OCCUPATIONAL TITLES

The Industrial Arts curriculum is intended to be very broad and to provide for students an orientation to a wide range of occupations. The U.S. Department of Education has established 15 career clusters as categories for instruction and study. Each cluster is composed of related jobs and careers. The career clusters studied through the Industrial Arts curriculum include the following:

Communication
Construction
Manufacturing
Transportation

Specific occupational titles related to each of these four clusters are included in the cluster listings located at the end of this section of the guide.

USING VIRGINIA VIEW TO OBTAIN OCCUPATIONAL INFORMATION

The Virginia Vital Information Education Workshops (VIEW) microfiche Deck is one part of a career information delivery system sponsored by the Virginia Occupational Information Coordinating Committee to deliver educational and occupational information to citizens of the Commonwealth. Other means of delivering the career information are: (1) the Toll-Free Career Information Hotline (1-800-542-5870); (2) publications, including the Dictionary of Licensed Occupations in Virginia, the Dictionary of Apprenticeship Occupations in Virginia, the Forum newsletter, and occupational briefs modified for making transparencies on 25 occupations for classroom use in career counseling and career education; and (3) the computerized delivery system used in conjunction with the microfiche deck.

The Virginia VIEW Career Information System is available at no cost to a variety of users and user agencies, including secondary and middle schools, community colleges, private and public colleges and universities.

The Virginia VIEW Microfiche Deck contains 70 microfiche. The deck is divided into six parts: 52 fiche cards containing 345 VIEWSCRIPTS (occupational briefs) arranged alphabetically within seven Data-People-Things Clusters; 4 fiche cards (tan) containing information on postsecondary schools in Virginia, including community colleges, two-year public and private institutions, public colleges and universities, and proprietary schools; 4 fiche cards (white) on financial aid; 1 fiche card (gold) listing additional training and the vocational education directors; 1 fiche card (brown) on apprenticeship programs in Virginia; 2 fiche cards (blue) on military

training opportunities; 4 fiche cards (light green) containing information on postsecondary school programs, and 1 fiche card (dark green) containing information on secondary school subjects.

Plans are that a microfiche deck will be issued each year, providing updated, current, and accurate information.

The 1982 Virginia VIEW Microfiche Deck presents information on 345 occupational titles and 1,269 related occupational specialties. The occupational titles were selected to represent the occupations in which most Virginians are presently employed based on data from the Virginia Employment Commission. The microfiche decks are distributed without cost to the user agencies who provide their own readers or reader printers.

A microcomputer system has been developed to be used in conjunction with the microfiche deck. The microcomputer system is based on a Virginia VIEW self-assessment, Career Search, which is designed to assess seven key areas: interests, areas of work, physical strengths, physical capabilities, working conditions, educational levels, and temperaments. The user is able to key the results of the Career Search into a microcomputer which then provides the user with a list of occupations that might be considered. It also directs the user to the appropriate microfiche to obtain information about the selected occupations. There is no charge for the microcomputer software; however, a user must have access to a microcomputer.

Virginia VIEW information related to the four career clusters studied in the Industrial Arts curriculum is included at the end of this guide section. Selected occupational titles related to each cluster are listed; the microcomputer access number and microfiche location code for each title are noted.

Teachers may obtain more information for student use of the system from their school librarian, their divisional director of vocational education, or the following:

Project Director
Virginia VIEW
Virginia Polytechnic Institute and State University
301 University City Office Building
Blacksburg, Virginia 24061
Phone: (703) 961-7158

Communication

Industrial Arts Courses:

Junior High

or

Middle School

Exploring Technology

Manufacturing

Modern Industry

High School

Basic Technical Drawing

Communication Technology

Engineering Drawing

Graphic Communications

Cluster 1

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
30	Advertising Agent	DP33
62	Advertising Sales Rep	DP33
286	Airline-Radio Operator	DT26
376	Alarm System Installer & Repairer	DT12
333	Announcer	DP41
23	Assistant-Press Operator	DT26
275	Audio Operator	DT15
203	Bindery Worker	T4
203	Bookbinder	T4
275	Broadcast Technician	DT15
161	Cable Installer-Repairer	DT22
193	Cartoonist	DP50
327	Commercial Artist	DPT46
143	Commercial Drafter	DT18
2	Compositor & Typesetter	DT16
40	Computer Operator	DT16
41	Computer Programmer	D1
157	Computer Service Tech	DT16
42	Computer Systems Analyst	DP35
40	Computer-Peripheral-Equipment Operator	DT16
50	Computer-Terminal Operator	DT21
220	Copy Reader & Proof Reader	D1
30	Copy Writer	DP33
40	Data Processing Auxiliary Equipment Operator	DT16
132	Dispatcher	DP36
54	Dispatcher Clerk	DT25
143	Drafter	DT18
222	Duplicating Machine Operator	T5
220	Editorial Assistant	D1
297	Electric-Organ Inspector and Repairer	DT25
144	Electrical & Electronics Engineer	DT18
144	Electrical & Electronics Engineering Technician	DT18
145	Electrical & Electronics Technician	DT18
143	Electrical Drafter	DT18
144	Electrical Engineer	DT18
375	Electrical-Instrument Repairer	DT21
365	Electromedical-Equipment Repairer	DT14
144	Electronics Engineer	DT18
145	Electronics Mechanic or Technician	DT18
52	Embossing-Machine Operator	T8
24	Embossing-Press Operator	T9
23	Engraving-Press Operator	DT26
45	Estimator	DP36

COMMUNICATION CAREER INDEX TO
VIRGINIA VIEW CAREER INFORMATION SYSTEM

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
85	Folder	T7
52	Folding-Machine Operator	T8
327	Graphic Designer	DPT46
327	Illustrator	DPT46
243	Industrial Arts Teacher	DP44
329	Industrial Designer	DPT47
375	Instrument Repairer	DT21
331	Landscape Architect	DPT48
362	Laser Technician	DT21
161	Line Person, Assembly	DT21
21	Lithographic Plate Maker	DT25
354	Magnetic-Tape-Composer Operator	DT30
296	Mail-Processing-Equipment-Mechanic	DT24
143	Marine Drafter	DT18
143	Mechanical Drafter	DT18
149	Mechanical Engineer	DT22
150	Mechanical Engineer Technician	DT22
195	Motion Picture Photographer	DPT50
210	Motion Picture Projectionist	DT24
363	Nuclear Engineer	DT24
296	Office Machine Repairer	DT24
222	Offset-Duplicating-Machine Operator	T5
23	Offset-Press Operator	DT26
51	Patent Lawyer	DP38
194	Photo Process Worker	T9
2	Photocomposing-Machine Operator	DT16
222	Photocopying-Machine Operator	T5
21	Photoengraver & Lithographer	DT25
194	Photofinishing Lab Worker	T9
195	Photographer	DPT50
222	Photographic-Machine Operator	T5
195	Photojournalist	DPT50
2	Phototypesetter Operator	DT16
23	Platen-Press Operator	DT26
195	Portrait Photographer	DPT50
212	Power Station Operator	DT26
23	Printer	DT26
23	Printing Press Operator	DT26
220	Proofreader	D1
191	Publications Editor	DP38

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
333	Radio & Television Announcer	DP41
162	Radio & Television Repairer	DT26
286	Radio Operator	DT26
286	Radio Station Operator	DT26
275	Recording Engineer	DT15
103	School Teacher, Secondary	DP42
243	School Teacher, Industrial Arts	DP44
392	Screen Printers	T10
334	Sign Painter	DT27
160	Small-Appliance Repairer	DT21
145	Sound Technician	DT18
195	Still Photographer	DPT50
153	Surveyor	DT29
289	Surveyor Helper	DT29
103	Teacher, Secondary School	DP42
243	Teacher, Industrial Arts	DP44
243	Teacher, Vocational Education Teacher	DP44
335	Technical Writer	D2
162	Television-and-Radio Repairer	DT26
275	Transmitter Operator	DT26
296	Typewriter Repairer	DT24
196	Urban & Regional Planner	DP43
65	Varitype Operator	DT29
275	Video Operator	DT15
243	Vocational Industrial Arts Teacher	DP44
23	Web-Press Operator	DT26

Construction

Industrial Arts Courses:

Junior High

or

Middle School

Construction

Exploring Technology

Modern Industry

High School

Architectural Drawing

Basic Technical Drawing

Electricity and Electronics Technology

Metals Technology

Woods Technology

Cluster 2

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
139	Absorption-And-Adsorption Engineer	DT15
151	Acoustical Physicist	DT25
298	Air-Compressor Mechanic	DT26
395	Air-Cond., Heating, & Refrig. Mechanic	DT12
395	Air-Cond. Installer	DT12
155	Air-Cond. Mechanic	DT12
218	Appraiser	DP34
28	Arc Welder	T11
188	Architect	DPT45
143	Architectural Drafter	DT18
249	Asbestos & Insulation Worker	T4
123	Asphalt-Paving-Machine Operator Assembler	T6
258	Automatic Nailing-Machine Operator	T10
113	Brick Chimney Builder	DT14
113	Brickmason/Stonemason	DT14
84	Building Maintenance Repairer	T6
115	Cabinetmaker	DT15
116	Carpenter	DT15
117	Carpet Installer	DT15
118	Cement Mason	DT15
142	Civil Engineer	DT16
123	Concrete-Paving Machine Operator	T6
250	Construction Inspector	DP35
119	Construction Laborer	T4
120	Construction Painter	DT17
119	Construction Worker	T4
252	Earth Driller	DT18
123	Earth-Boring-Machine Operator, Earth Driller	DT18
292	Electric Sign Installer & Repairer	DT18
250	Electrical Inspector	DT35
145	Electrical Technician	DT18
122	Electrician	DT19
253	Elevator Constructor	DT19
253	Elevator Repairer	DT19
387	Energy Efficiency Technician	DT19
395	Environmental-Control-Systems Installer-Servicer	DT12
142	Environmental Engineer	DT16
45	Estimator	DP36
123	Excavating/Grading/Road Machine Operator	T6
25	Exhauster Engineer	DT28
236	Exterminator	DT25

CONSTRUCTION CAREER INDEX TO
VIRGINIA VIEW CAREER INFORMATION SYSTEM

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
116	Finish Carpenter	DT15
338	Forest Ecologist	DT19
338	Forester	DT19
252	Foundation-Drill Operator	DT18
28	Gas Welder	T11
125	Glass Installer	DT20
125	Glazier	DT20
342	Grader	T9
199	Groundskeeper, Industrial Commercial	T6
387	Heating, Air-Conditioning & Refrigeration Technician	DT19
159	Heavy Equipment Mechanic	DT21
345	Historical Archeologist	DP33
119	Hod Carrier	T4
121	Hoisting Engineer	T5
144	Illuminating Engineer	DT18
243	Industrial Arts Teacher	DP44
83	Inspector	DP38
249	Insulation Installer	T4
55	Job Analyst	DP40
331	Landscape Architect	DPT48
255	Lather	T7
161	Line Person, Assembly	DT21
45	Lumber Estimator	T6
134	Lumber Yard Worker	T6
115	Maintenance Cabinetmaker	DT15
116	Maintenance Carpenter	DT15
122	Maintenance Electrician	DT19
396	Maintenance Mechanic	DT22
126	Maintenance Repairer, Building	DT25
149	Mechanical Engineer	DT22
150	Mechanical Engineer Technician	DT22
234	Meter Reader	D2
18	Millwright	DT23
284	Mining Engineer	DT24
193	Painter & Sculptor	DPT49
256	Paperhanger	T9
257	Plasterer	T9
126	Plumber & Pipe Fitter	DT25
212	Power Station Operator	DT26
212	Power-Plant Operator	DT26
123	Power-Shovel Operator	T6
35	Property Manager	DP34

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
25	Refrigerating Engineer	DT28
127	Roofer	DT27
393	Safety Engineer	DT27
103	School Teacher, Secondary	DP42
243	School Teacher, Industrial Arts	DP44
128	Sheet Metal Worker	DT27
394	Shipwright	T10
142	Structural Engineer	DT16
129	Structural Iron Worker	DT28
153	Surveyor	DT29
289	Surveyor Helper	DT29
103	Teacher, Secondary School	DP42
243	Teacher, Industrial Arts	DP44
243	Teacher, Vocational Education Teacher	DP44
163	Telephone Installer & Repairer	DT29
260	Tile Setter	T10
121	Truck-Crane Operator	T5
196	Urban & Regional Planner	DP43
243	Vocational Industrial Arts Teacher	DP44
28	Welder	T11
281	Welding Engineer	DT23
252	Well-Drill Operator	DT18
338	Wood Technologist	DT19

Manufacturing

Industrial Arts Courses:

Junior High

or

Middle School

Exploring Technology

Manufacturing

Modern Industry

High School

Electricity and Electronics I & II

Engineering Drawing

Materials and Processes Technology

Metals Technology I & II

Woods Technology I & II

Cluster 3

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
139	Absorption-And-Adsorption Engineer	DT15
29	Accountant	D1
33	Accounting Clerk	DT14
272	Aeronautical Engineer	DT12
272	Aeronautical Test Engineer	DT12
272	Aeronautical-Design Engineer	DT12
272	Aeronautical-Research Engineer	DT12
298	Air-Compressor Mechanic	DT26
395	Air-Conditioning, Heating, and Refrig. Mechanic	DT12
298	Air-Valve Repairer	DT26
376	Alarm System Installer & Repairer	DT12
8	Annealer	DT20
208	Antiquer	DT20
1	Appliance Assembler, Line	T4
160	Appliance Repairer	DT21
28	Arc Welder	T11
149	Asbestos & Insulation Worker	T4
216	Assembler, Plastics	T9
1	Assembly Line Worker	T4
296	Assembly Technician	DT24
23	Assistant-Press Operator	DT26
291	Auto Accessories Installer	T4
154	Auto Body Repairer	DT13
7	Automatic Grinder Operator	DT20
258	Automatic Nailing-Machine Operator	T10
3	Automatic-Glass-Cutting Machine Operator	T5
245	Automobile Accessories Sales	DP34
149	Automotive Engineer	DT22
11	Automotive Machinist	DT22
215	Band-Scroll-Saw Operator	T10
66	Bench Hand	DT13
203	Bindery Worker	T4
202	Boiler Inspector	DT14
202	Boiler Mechanic, Maker	DT14
22	Buffer	T9
115	Cabinetmaker	DT15
206	Calender Operator	T4
88	Carver	T7
139	Chemical Engineer	DT15
194	Chemical Mixer	T9
139	Chemical Processes Design Engineer	DT15
140	Chemical Technician	DT16
140	Chemical-Laboratory Technician	DT16

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
139	Chemical-Test Engineer	DT15
164	Chemistry Technologist	DT16
302	Coin-Machine-Service Repairer	DT30
28	Combination Welder	T11
216	Compression-Molding-Machine Operator	T9
11	Construction Equipment Machinist	DT22
252	Core-Drill Operator	DT18
15	Coremaker	T8
29	Cost Accountant	D1
215	Cut-Off-Saw Operator	T10
351	Cutter Operator	T8
3	Cutting Machine Operator	T5
23	Cylinder-Press Operator	DT26
14	Die Setter	DT23
26	Die Sinker	DT29
26	Die-Casting and Plastic Molding Mold Maker	DT29
4	Drill-Press Operator	T5
379	Driller	DT24
207	Drop-Hammer Operator	DT20
55	Education & Training Manager	DP40
1	Electrical Accessories Assembler	T4
160	Electrical-Appliance Servicer	DT21
1	Electronics Assembler	T4
45	Estimator	DP36
11	Experimental Machinist	DT22
281	Extractive Metallurgist	DT23
216	Extruder Operator	T9
84	Factory or Mill Maintenance Repairer	T6
207	Forge & Hammer Operator	DT20
207	Forging-Press Operator	DT20
281	Foundry Metallurgist	DT23
208	Furniture & Wood Finisher	DT20
1	Furniture Assembler	T4
208	Furniture Finisher	DT20
27	Furniture Upholsterer	T11
28	Gas Welder	T11
160	Gas-Appliance Servicer	DT21
25	Gas-Compresser Operator	DT28
300	Gas-Engine Repairer	DT28
7	Gear Grinder	DT21
7	Grinding Machine Operator	DT20

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
201	Hand Former	DT14
8	Heat Treater	DT20
159	Heavy Equipment Mechanic	DT21
207	Heavy Forger	DT20
142	Hydraulic Engineer	DT16
258	Hydraulic Riveter	T10
243	Industrial Arts Teacher	DP44
44	Industrial Economist	DP36
146	Industrial Engineer	DT21
1	Industrial Equipment Assembler & Wirer	T4
124	Industrial Truck Operator	T6
216	Injection-Molding-Machine Operator	T9
83	Inspector	DP38
375	Instrument Mechanic	DT21
375	Instrument Repairer	DT21
63	Inventory Clerk	DT28
294	Jeweler & Watchmaker	DT21
215	Jigsaw Operator	T10
55	Job Analyst	DP40
6	Kiln Operator	DP20
392	Knitting Machine Operator	T10
55	Labor Relations Manager	DP40
362	Laser Technician	DT21
1	Machine Assembler	T4
11	Machine Builder	DT22
10	Machine Oiler	T7
11	Machinist	DT22
11	Maintenance Machinist	DT22
396	Maintenance Mechanic	DT22
146	Manufacturing Engineer	DT21
63	Material Clerk	DT28
134	Material Handler	T6
149	Mechanical Engineer	DT22
150	Mechanical Engineer Technician	DT22
14	Metal Job & Die Setter	DT23
15	Metal Molder	T8
16	Metal Plater	DT23
214	Metal Roller & Finisher	DT23
17	Metal Working Machine Operator	T8
281	Metallurgical Engineer	DT23
18	Millwright	DT23

MANUFACTURING CAREER INDEX TO
VIRGINIA VIEW CAREER INFORMATION SYSTEM

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
296	Office Machine Repairer	DT24
20	Pattern & Model Maker	DT24
334	Patternmaker	DT27
281	Physical Metallurgist	DT23
151	Physicist	DT25
149	Plant Engineer	DT22
216	Plastic Products Man	T9
20	Plastics Patternmaker	DT24
22	Polisher & Buffer	T9
207	Press Operator	DT20
45	Production Estimator	DP36
17	Production Lathe Operator	T8
28	Production Line Welder	T11
24	Punch & Stamping Press Operator	T9
58	Purchasing Agent	DP41
146	Quality-Control Engineer	DT21
322	Recreation Worker	DP42
258	Riveter & Fastener	T10
393	Safety Engineer Manufacturing	DT27
112	Sales Rep, Industrial Machinery	DP44
112	Sales Rep, Publications	DP44
259	Sandblaster	T10
103	School Teacher, Secondary	DP42
243	School Teacher, Industrial Arts	DP44
128	Sheet Metal Worker	
61	Shipping & Receiving Clerk	DT27
160	Small-Appliance Repairer	DT21
93	Stock Handler	DT28
103	Teacher, Secondary	DP42
243	Teacher, Industrial Arts	DP44
243	Teacher, Vocational Education Teacher	DP44
392	Textile Production Worker	T10
146	Time-Study Engineer	DT21
205	Tire Builder	T11
26	Tool & Die Maker	DT29
63	Tool-Crib Attendant	DT28
26	Tool-Machine Set-Up Operator	DT29
296	Typewriter Repairer	DT24
27	Upholsterer	T11
302	Vending Machine Mechanic	DT29
243	Vocational Industrial Arts Teacher	DP44

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
294	Watchmaker	[illegible]
28	Welder	T[illegible]
281	Welding Engineer	DT23
20	Wood Model Maker	DT25
338	Wood Technologist	DT19

Transportation

Industrial Arts Courses:

Junior High

or

Middle School

Exploring Technology

Manufacturing

Modern Industry

High School

Energy and Power

Engineering Drawing

Metals Technology

Power and Transportation Technology

Cluster 4

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
272	Aerodynamist	DT12
272	Aeronautical & Astronaut Engineer	DT12
272	Aeronautical Engineer	DT12
272	Aeronautical Test Engineer	DT12
272	Aeronautical-Design Engineer	DT12
272	Aeronautical-Research Engineer	DT12
263	Agriculture Aircraft Pilot	DT12
155	Air-Conditioning Mechanic	DT12
261	Air-Traffic Controller	DPT45
290	Aircraft Accessories Mechanic	DT12
290	Aircraft Mechanic	DT12
290	Aircraft Plumbing & Hydraulics Mechanic	DT12
132	Airline Dispatcher	DP36
290	Airplane Inspector	DT12
263	Airplane Pilot	DT12
291	Auto Accessories Installer	T4
154	Auto Body Repairer	DT13
155	Auto Mechanic	DT13
245	Auto Parts Service Clerk	DP34
122	Automotive Electrician	DT19
149	Automotive Engineer	DT22
11	Automotive Machinist	DT22
245	Automotive Parts Counter Clerk	DP34
202	Boiler Inspector	DT14
202	Boiler Mechanic	DT14
25	Boiler Operator	DT28
155	Brake Repairer	DT13
155	Carburetor Mechanic, Auto	DT13
290	Carburetor Mechanic, Aircraft	DT12
234	Chief Meter Reader	D2
364	Chief Petroleum Engineer	DT25
263	Commercial Airplane Pilot	DT12
298	Diesel Locomotive Repairer	DT26
397	Diesel Mechanic	DT17
77	Equipment & Vehicle Cleaner	T5
45	Estimator	DP36
263	Executive Pilot	DT12
158	Farm Implement Repairer	DT19
134	Freight & Material Handler	T6
155	Front-End Mechanic	DT13
131	Fuel-Oil-Delivery Driver	DPT46

MICRO-COMPUTER ACCESS NUMBER	OCCUPATION TITLE	MICROFICHE LOCATION CODE
137	Heavy Truck Driver	T11
121	Hoisting Engineer	T5
142	Hydraulic Engineer	DT16
212	Hydroelectric-Station Operator	DT26
243	Industrial Arts Teacher	DP44
124	Industrial Truck Operator	T6
110	Lubrication Services	PT21
149	Mechanical Engineer	DT22
150	Mechanical Engineer Technician	DT22
284	Mining Engineer	DT24
363	Nuclear Engineer	DT24
300	Outboard-Motor Mechanic	DT28
364	Petroleum Engineer	DT25
151	Physicist	DT25
212	Power-Plant Operator	DT26
298	Railway Equipment Repairer	DT26
393	Safety Engineer, Trucking	DT27
103	School Teacher, Secondary	DP42
243	School Teacher, Industrial Arts	DP44
110	Service Station Attendant	PT32
61	Shipping & Receiving Clerk	DT27
300	Small Engine Repairer	DT28
103	Teacher, Secondary School	DP42
243	Teacher, Industrial Arts	DP44
243	Teacher, Vocational Education	DP44
158	Tractor Mechanic	DT19
137	Tractor-Trailer-Truck Driver	T11
155	Transmission Mechanic	DT13
136	Transportation Agent	DPT52
142	Transportation Engineer	DT16
137	Truck Driver	T11
121	Truck-Crane Operator	T5
155	Tune-up Mechanic	DT13
243	Vocational Industrial Arts Teacher	DP44

SECTION II.

STUDENT ORGANIZATIONS

Each vocational student organization provides opportunities for students to (1) exhibit pride in work; (2) demonstrate competencies related to the world of work; and (3) develop leadership abilities, responsible citizenship, and a realistic self-image. These goals are achieved through activities structured within each vocational program and course. Vocational student organizations provide a means through which students become involved in school and community activities, carry out individual or group projects related to career or life goals, and meet with community leaders and employers in a variety of situations. The knowledge, skills, and attitudes developed through these organizations facilitate the students' transition from school to their chosen vocation and to responsible adulthood.

The Vocational Education Amendments of 1976, P. L. 94-482, place emphasis on assurance that curriculum development activities will have an impact on instruction in vocational education classrooms. Each vocational service has an appropriate vocational student organization operating as an integral part of the instructional program.

On June 23, 1978, the Virginia State Board of Education approved the following policy standards for operation of vocational education programs:

- A local chapter of the appropriate vocational student organization is operating as an integral part of each vocational program field in the school.

- Vocational teachers are serving as advisors to the local chapter or a section of the vocational student organization.

- Participation of students in chapter instructional activities is required, regardless of whether they are paid members of the organization.

Competency Development in Industrial Arts

Through

American Industrial Arts Student Association

I. Description of Organization

The American Industrial Arts Student Association, known as AIASA, (pronounced I-A-Sa), is the only student organization devoted exclusively to the needs of Industrial Arts students who are presently enrolled in, or who have completed, Industrial Arts courses. AIASA was started by teachers who wanted to provide opportunities for their Industrial Arts students to increase leadership abilities and attain recognition for their achievements. Because AIASA is part of Industrial Arts Education, it has attained the recognition of many teachers' organizations and agencies.

Mission of AIASA. The mission of AIASA is to provide students with an opportunity to become involved with meaningful activities and experiences that prepare them to understand, contribute to, and live in a changing technical world.

Organizational Levels of AIASA. The organization of AIASA begins at the classroom/laboratory level of Industrial Arts. Here students use AIASA activities and learn how to participate in a democratic organization. At the school level, a chapter is organized by and for students who are to be members of an ongoing association of Industrial Arts students. As members of AIASA, students earn recognition for their achievements in Industrial Arts and participate in leadership development and community-service projects.

The regional and state levels of AIASA permit students from different schools to work and learn together through leadership conferences, project exhibits, and competitive events. The national level of AIASA provides opportunities for all members to work and learn together with students throughout the United States of America.

II. Opportunities for Class or Laboratory/AIASA Coordination

A. Leadership Development Activities

Students will acquire an understanding of democratic organizational principles through participation in activities as leaders and followers.

1. Introduce students to democratic organization principles used by most groups.

2. Organize in-class officers to lead and manage class.

3. Manage personnel system and routine duties in classroom or laboratory.

4. Conduct class meetings to determine activities/projects for course.

5. Plan activities which apply the Industrial Arts content as class or chapter project.

B. Industrial/Community Resources for Instruction

Students will acquire technical understanding and competencies which lead to responsible consumerism, productive use of leisure time, and improved work skills through contact with technological personnel and resources.

1. Organize class committee to identify resource people and materials related to course content.

2. Invite speaker from industry or community to speak to class.

3. Use industrial personnel to give technical advice to students on activities/projects in class.

4. Obtain supplies, tools, and literature from industry or business in community to supplement laboratory and chapter activities.

5. Display student work in community for public viewing.

6. Arrange field trips to local industry for small groups or class.

C. School/Community Service Activities

Students will develop responsible attitudes toward citizenship and community service through participation in the planning, organizing, and carrying out of activities and projects which contribute to an improvement in or service to the school or community.

1. Organize class committee to identify and plan services needed by others.

2. Select service activity related to content of course.

3. Use mathematics, science, and English teachers to help apply these subjects appropriately in service activity.

4. Make objects or provide service for school, needy persons, or a civic group.

5. Promote participation in a non-profit cause or program of school or community.

6. Demonstrate technical area of course to young students in feeder school.

7. Enjoy socialization between students as they work together to serve someone else.

D. Enterprising a Product or Service of Economic Value

Students will become knowledgeable of career opportunities and their requirements through participation in projects which emphasize the private enterprise system. Policies and procedures of the local school division, as well as community restrictions or guidelines, will govern the type of enterprising activities that any school organization may undertake.

1. Organize class committee to prepare prototypes of products or potential services related to course.

2. Interview principal and school groups for products/services needed.

3. Organize class as a company related to content of course.

4. Contract to make products for AIASA Chapter or other organization to resell or donate.

5. Provide technical service to individuals at a set fee (drawings, repairs, models, etc.).

6. Determine employment and self-employment opportunities related to enterprise activities.

7. Reproduce a popular student project, if it exhibits consumer appeal.

8. Have class treasurer account for income and disbursements of enterprise.

E. Activities for Recognition

Students will acquire not only an understanding of what constitutes a high standard but also a desire to perform at the maximum levels of their abilities through recognition for outstanding artisanship and scholarship.

1. Organize a class committee to prepare list of contents and dates for events appropriate to students in class.

2. Introduce all students to contests and AIASA activities.

3. Present in-class awards for outstanding achievements in projects or class assignments.

4. Plan an in-class or department "Open House" to recognize student work.

5. Pre-register individuals or groups in regional fair or spring festival.

6. Prepare and practice for competitive events as class assignments.

7. Invite school and community personnel to judge and advise students.

III. Other Programs and Publications

A. News and Current Information

1. The Virginia Scene for Industrial Arts Students (State AIASA Newsletter)

2. The School Scene (National AIASA Newsletter)

3. Registration Packet for Virginia Industrial Arts Spring Festival

4. Conference Information for AIASA National Conference

B. Guides and Resources

1. IA-82-1 — AIASA Guide 1: Organizing the Industrial Arts Association, 1980; Explains how to establish and operate an AIASA chapter (66 pages).

2. IA-82-2 — AIASA Guide 2: Student Association Activities in Industrial Arts Instruction, 1979; Illustrates how to use AIASA activities as teaching tools (56 pages).

3. IA-82-3 — AIASA Guide 3: Advisor's Handbook, 1981; (287 pages).

4. IA-82-4 — AIASA Guide 4: Officer's Handbook, 1981; Sections include leadership development, meeting procedures, committees and conference participation (79 pages).

5. IA-82-5 — AIASA Guide 5: Annual Program of AIASA Activities, 1981; Identifies the basic activities necessary to have an AIASA chapter serve members and achieve goals. Explains regional and local activities (27 pages).

6. IA-82-6 — AIASA Guide 6: Standards for AIASA Events, 1982; Identifies permanent rules for AIASA Regional Fairs and the Industrial Arts Spring Festival (92 pages).

C. Audiovisual Materials

1. Art of Communication: How to Conduct a Meeting, State Film #21908

2. Organizing the Industrial Arts Student Association, Slide/Tape Program

3. Move With Tomorrow (Activities from class to conference.) Slide/Tape Program

4. Organizing the Industrial Arts Student Association, Transparencies in back of Guide 1.

5. In-Class AIASA Management, 3/4" ETV Tape

6. AIASA--A Classroom Experience, National AIASA Slide/Tape Program

SECTION III.

CLASSROOM MANAGEMENT SYSTEMS

If students in Industrial Arts programs and courses are to be provided with the instruction necessary for entry into an advanced vocational program, then a systematic method of instruction must be used. In addition, the inclusion of the following unique requirements in competency-based education demands a higher degree of organization than may have been incorporated in traditional vocational instruction:

1. Validated task/competencies must be included in instruction.
2. Task/competencies must be specified to students prior to instruction.
3. Criterion-referenced measures must be administered to evaluate the student's mastery of each validated task/competency.
4. A system must exist for recording student achievement in regard to each validated task/competency.

The following questions should be considered during the establishment of classroom management (or instructional delivery) systems for competency-based instruction in Industrial Arts programs and courses:

1. How and when will students be informed of course or unit objectives and requirements?
2. How will instructional content and activities be sequenced in the course?
3. Will students learn in an independent or group setting?
4. Will a variety of instructional methods and strategies be used?
5. How will laboratory and lecture activities be integrated?
6. How will slow and fast learners be accommodated?
7. How will AIASA activities be integrated into instruction?
8. What will be the methods and intervals of student evaluation?

9. How and when will student achievement be documented on the competency record?

10. How will students who transfer from another school or program be placed at an appropriate level in the program?

The purpose of this section is to illustrate several samples of classroom management systems developed by teachers incorporating competency-based vocational education techniques into their courses and programs. The systems have been field tested and revised for use in laboratories and classrooms in Virginia.

The following classroom management systems are discussed in this section:

Instructional Unit Plans for CBE
Lesson Plans
Student Project Activity Sheets
Learning Contracts
Self-Contained Learning Systems
Personnel Management System

It is important to note that any combination of the above systems may be used by the individual classroom teacher in actual delivery of instruction. The Student Personnel System, in particular, is designed to help teachers manage class and laboratory activities with student involvement.

INSTRUCTIONAL UNIT PLANS FOR CBE

The "Competency-Based Education Implementation" form which follows is designed to aid teachers in the management of competency-based instructional delivery through the designation of instructional units. Instructional units within an Industrial Arts course may be developed to concur with the Content/ Concept Areas which have been identified for the course. The form allows for the listing of the task/competencies to be included in each instructional unit, as well as the recording of completion time needed for the unit and each of the component task/competencies. Completion of the form provides the teacher with a basic plan of instructional delivery, which allows for the subsequent development on individual lesson plans for each of the task/ competencies listed. Coordinated use of the unit and lesson plan forms aids the classroom teacher in meeting the following four standards identified for competency-based education:

Standard I. ROLE-RELEVANT COMPETENCIES ARE IDENTIFIED AND STATED.
Through completion of the implementation form, the teacher lists the role-relevant competencies which have been identified and validated for inclusion in the course. Guides are available which identify the task/ competencies for the 15 Industrial Arts courses.

Standard II. COMPETENCIES ARE SPECIFIED TO STUDENTS PRIOR TO INSTRUCTION.
In preparing lesson plans for each task/competency, the teacher should plan to familiarize students with tasks and objectives as an introductory activity. Additionally, a complete task/competency list might be distributed during initial course activities.

Standard III. CRITERION-REFERENCED MEASURES ARE USED TO MEASURE ACHIEVEMENT OF COMPETENCIES.
The performance objective contains criteria for determining student achievement of task/competencies. Many methods of testing or measuring student achievement are available. The Industrial Arts Education Service has contracted with the Virginia Industrial Arts Association for the development of a series of tests based on the

criterion-referenced measures identified in course task/competency catalogs. These tests are designed to measure achievement in affective, cognitive, and psychomotor domains. The tests are available to teachers through the Industrial Arts Education Service of the Virginia Department of Education. The means of measurement selected by the individual classroom teacher should be identified on the lesson plan form.

Standard IV. A SYSTEM EXISTS FOR DOCUMENTING THE COMPETENCIES ACHIEVED BY EACH STUDENT.

Sample documentation forms are available in Section IV of this guide. As course instruction proceeds through delivery of instructional units and lesson plans, the teacher should document individual student achievement of identified task/competencies.

In planning for the instructional units to be included in a given Industrial Arts course, the classroom teacher should follow these steps for the delivery of competency-based instruction:

1. Gather Industrial Arts catalogs and materials that identify task/competencies for the specific course and provide general information for all courses in the program.

2. Identify instructional units for the course according to the identified content/concept areas.

3. Assign time estimates for completion of each unit of instruction.

4. List all task/competencies for each unit.

5. Develop lesson plans for competency-based instruction in each of the task/competencies identified.

COMPETENCY BASED EDUCATION
IMPLEMENTATION
BY

_____
Teacher

_____ / _____ _____
Title Code School
Course or Program

Role relevant competencies for course/program verified by _____

Instructional Unit	Time	Instructional Unit	Time
	Hrs.		Hrs.
Task/Competencies		Task/Competencies	
58			59

Instructional Unit	Time Hrs.	Instructional Unit	Time Hrs.
Task/Competencies		Task/Competencies	

LESSON PLANS

Competency-based education requires that instructional content within vocational education courses be based upon predetermined competencies and objectives. Ensuring the actual achievement of intended course outcomes requires a very high degree of organization in daily planning for instruction. The lesson plan is a most effective tool for organizing and implementing instruction within each class session.

The lesson plan may be viewed as a detailed part of a blueprint for the total course. It assures that the instructional content for each class session is related to overall course objectives and that content across class sessions is sufficiently inclusive and sequenced so that predetermined course outcomes are, in fact, achieved. Additionally, it assures effective use of instructional activities and materials in delivering the instructional content of each class session.

Lesson plan format may vary according to teacher preference or local requirements. The lesson plan format included in this section was chosen due to its incorporation of commonly accepted components. In addition, the format corresponds to that of the task/competency framework pages included in the instructional task/competency package developed for each Industrial Arts course (see Figure 1).

The listing which follows includes a description of the components of the sample lesson plan (Figure 2). Where appropriate, the component is cross-referenced to the corresponding section(s) of Figure 1, and referral to that section in the actual instructional task/competency package for the course provides the teacher with useful information in developing the lesson plan component.

LESSON PLAN COMPONENTS

LESSON TITLE--summarizes the content of the lesson; primarily serves as aid to instructor in readily locating a needed plan that is already developed.

COURSE--identifies course in which lesson plan is to be implemented; may include more than one listing in cases where a given task/competency is identified for inclusion in several courses. (Figure 1, #4)

INSTRUCTIONAL UNIT--refers to a distinct grouping of related task/competencies; Content/Concept area may be listed here. (Figure 1, #1)

TASK/COMPETENCY--identifies the knowledge, skills, or attitudes which the learner should possess after the lesson plan is implemented. (Figure 1, #2)

PERFORMANCE OBJECTIVE--states the behavior or performance to be exhibited by the student after instruction, the condition under which the behavior takes place, and the criterion level or standard which the performance must meet for student mastery. (Figure 1, #5)

TOOLS/MATERIALS--includes any tools, equipment, or materials that will have to be secured or developed by the instructor in implementing lesson plan activities. (Figure 1, #9)

AUDIOVISUALS--refers to any nonprint materials used in lesson plan activities. (Figure 1, #10)

REFERENCES--includes any printed materials to be used by students in lesson plan activities; may also include resources that are helpful to the instructor in implementing the lesson, but not intended for direct student use. (Figure 1, #11)

STUDENT ASSIGNMENTS--identifies activities the student will complete to reinforce or apply learning. (Figure 1, #6, #8)

PRESENTATION--describes all lesson plan activities, listed in sequence and grouped according to the following types and purposes (Figure 1, #5, #8)

- Introduction--to orient, to motivate, to provide continuity (Teacher should specify task/competency(ies) prior to presentation of lesson.)

- Presentation--to bring student face to face with the new concept, habit, or skill; to explain; to demonstrate; to relate to learner experience

- Discussion--to clarify, to expand; to reinforce, to correct; to allow learner to verbalize, question, respond, and provide evidence of concept understanding

- Application--to apply, use, or verify concept; to build motor skills; to build habit; to develop attitudes through experiences

- Evaluation--to provide periodic closure; to modify concept; to expand divergent thinking; to summarize; to test (Teacher develops test or grading based on criterion-referenced measure.).

CRITERION-REFERENCED MEASURE--identifies the means of student evaluation and the minimum standard of performance accepted for mastery; should correspond with performance objective; teacher records achievement of task/competency on student's recording form. (Figure 1, #7)

SPECIAL NOTES--provides for instructor's notations concerning evaluation of the plan after it is implemented; may contain suggestions for future use of the plan.

Figure 1--Sample Task/Competency Framework Pages

Application

CONTENT/CONCEPT
①

TASK/COMPETENCY
②

PROGRAM
③

COURSE
④

PERFORMANCE OBJECTIVE
⑤

SELECTED ENABLING OBJECTIVES
⑥

CRITERION-REFERENCED MEASURE
⑦

SELECTED INSTRUCTIONAL ACTIVITIES
⑧

SELECTED TOOLS AND MATERIALS
⑨

SELECTED AUDIOVISUAL MATERIALS
⑩

SELECTED REFERENCES
⑪

Figure 2--Sample Industrial Arts Lesson Plan
(Front)

by

John A. Leader

Using Woodworking Resources in the Community
Lesson Title

(4) Woods Technology
Course

(1) Student Organization
Instructional Unit

TASK/COMPETENCY: (knowledge, skills, or attitudes student gains from instruction)

(2) Investigate community and technical resources

PERFORMANCE OBJECTIVE: (expected conditions, performance, and criterion or standard)

(5) Given resources and an opportunity to participate in AIASA classroom activities, participate in a class committee to investigate community and technical resources in accordance with student organization guidelines.

TOOLS/MATERIALS:

(9) Committee notebook for "Community Resources Committee"
Directory of local industries from Chamber of Commerce
Local telephone directory

AUDIOVISUALS:

(10)

REFERENCES:

(11) Student Association Activities in Industrial Arts Instruction, Guide 2.

STUDENT ASSIGNMENT(S):

(6) (8) Each class will form a "Community Resource Committee" to identify local industries and resources for speakers and field trips. Students will share ideas and may visit or call speakers to invite them to talk about their industrial work. Class may obtain materials, supplies, or consultative services from local people if proper contact is made.

Figure 2—Sample Industrial Arts Lesson Plan
(Reverse Side)

PRESENTATION: (Introduction, presentation, discussion, application & evaluation)

(5)
(8)

1. Inform students of objective for lesson: Investigate Community and Technical Resources.
2. Tell students about the value of contact with community resources for learning the content of this Industrial Arts course.
3. Review with students the components of a good business letter.
4. Show students how to obtain information about industries or businesses in the community, city, or county from libraries and directories.
5. Ask the students to list names of resources by open discussion and brainstorming.
6. Assign the Community Resources Committee to review the list and report for class voting on best choice.
7. Prepare questions for speaker or tour guide before visit.
8. Assist students in follow-up activities of writing letters and record-keeping.
9. Stress the importance of Industrial Arts as the study of industry and technology.
10. Indicate types of materials to solicit from local woods industries.
11. Assign students to make safety posters for local industry.

CRITERION REFERENCED MEASURES:

(7) Participate in a class-planned activity to investigate community and technical resources in accordance with student organization guidelines.
Teacher observes each student on Committee as they investigate resources.
Teacher may grade safety posters or other information related to industry speaker or used for visit.

SPECIAL NOTES: (Resource persons, if any; results and follow-up)

LESSON PLAN

by

_____

_____

Lesson Title

_____ _____

Course

Instructional Unit
(Content/Concept)

TASK/COMPETENCY: (knowledge, skills, or attitudes student gains from instruction)	
PERFORMANCE OBJECTIVE: (expected conditions, performance, and criterion or standard)	
TOOLS/MATERIALS:	AUDIOVISUALS:
REFERENCES:	
STUDENT ASSIGNMENT(S):	

PRESENTATION: (Introduction, presentation, discussion, application, & evaluation)

CRITERION REFERENCED MEASURE:

SPECIAL NOTES: (Resource persons, if any; results and follow-up)

STUDENT PROJECT ACTIVITY SHEETS

The planning sheet which follows is designed to aid the student and teacher in planning for a project or learning activity. Teachers are encouraged to adapt the form to accommodate the needs of their students, program, or course. The following components are included in the planning sheet in an effort to enhance its usability in the delivery of competency-based instruction:

1. Description of Learning Activity--allows the student to describe the activity through which the content will be learned.
2. Task/Competency List--identifies those course task/competencies which will be achieved by the student through successful completion of the project or activity.
3. Technical Illustration or Sketch--directs student to provide illustrations or specifications related to project activities or outcomes.
4. Inputs and Resources--aids student in planning for needed materials in completing project or activity.
5. Processes and Related Skills--provides for listing of project or activity steps and identification of related math and science skills.
6. Criteria for Evaluating Results--identifies the bases upon which project or activity results will be evaluated.
7. Student Comments--aids student in reflecting upon project procedures and results.
8. Teacher Comments--aids teacher in providing feedback to student and in completion of recordkeeping duties.

As a classroom and laboratory management tool, the project planning sheet provides the teacher with information about each student's activities. It promotes increased problem-solving abilities on the part of the student. Through its competency-based format, the plan allows for the student's advanced knowledge of what is to be learned. The planning sheet also provides for the application of scientific and mathematical concepts to technology.

PROJECT PLAN

by

_____
(Student's Name)

Teacher Approval
By:_____
Date:_____

Course:_____
Teacher:_____
Period:_____

DESCRIPTION OF LEARNING ACTIVITY	
In space below, write statement of your problem, activity, or name of project selected.	Check all items that describe your activities ___History of Technology ___Contemporary Use of Technology ___Future Use of Technology _____ _____ _____ _____ ___Individual Projects ___Group Project ___Duplication of Another Item ___Modified Design ___Production Prototype ___Experimental Device ___AIASA-Related Activity

TASK/COMPETENCY LIST

At the completion of this activity, the student will have demonstrated achievement of the following task/competencies:

1.

2.

3.

4.

5.

TECHNICAL ILLUSTRATION OR SKETCH

Develop a simple sketch to illustrate your project or tentative solutions to problem. Attach other drawings and specifications to this form.

PROCESSES TO BE USED List Steps or Procedures	TOOLS AND EQUIPMENT	MATERIALS AND SUPPLIES
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. (Continue steps on separate sheet.)		

CRITERIA FOR EVALUATING RESULTS

Add to this sample checklist any items from performance objectives for the task/ competencies you listed.

___ 1. Project functions as designated
___ 2. Measurements are accurate
___ 3. Experimental data recorded
___ 4. Activity completed
___ 5. Products were saleable
___ 6.
___ 7.
___ 8.
___ 9.
___10.

STUDENT COMMENTS	TEACHER COMMENTS
1. What modifications or problems were solved through your work?	1. How could this student have improved this activity or project?
2. Where or from whom did you obtain assistance with problem solving?	2. List below the numbers of task/ competencies achieved by student.
3. How could this activity be improved in the future?	3. Indicate student's rating.
4. List careers which are related to this activity.	4. Date evaluated by teacher: _____

LEARNING CONTRACTS

The learning contract is a management tool which allows the teacher and the individual student to agree, in advance, upon the components and outcomes of instruction. The typical learning contract contains the following elements:

1. the activities to be completed by the student
2. the time requirements for completion of designated activities
3. the expected quality of the student's performance
4. a final grade agreement
5. signatures of the teacher and student.

The learning contract depicts the learning atmosphere as one that involves shared responsibility and mutual obligation on the part of the student and the teacher. In essence, the teacher agrees to provide the necessary conditions for completion of contracted activities (e.g., information, directions, materials, time) and to evaluate the student's performance according to predetermined criteria. In turn, the student agrees to perform the given activities, within a specified period of time, and to an expected standard of quality.

Use of the learning contract in competency-based instruction within vocational education classrooms offers the following benefits:

1. Learning contracts aid the teacher in organizing instruction so that all identified competencies are covered in the duration of the course. Individual contracts may be designed to incorporate related competencies so that the time required for completion of all needed contracts coincides with the length of the course.

2. Learning contracts may involve the use of an unlimited variety of instructional methods, strategies, activities, materials, and grouping schemes.

3. Learning contracts accommodate instruction in the same content in classrooms of variable student academic skill levels and learning rates. For example, activities selected for slow learners may involve a greater degree of repetition or teacher direction; those selected for academically proficient students may involve increased learner independence and include additional enrichment projects.

4. Establishment of learning contracts provides a means for compliance with the competency-based education requirement that students be informed of instructional tasks and performance expectations prior to instruction.

5. Student motivation is enhanced by the student's involvement in contract preparation and awareness, prior to instruction, of what is expected of him or her.

LEARNING CONTRACT

Student:_____

Course:_____

I,_____,
(name of student)

agree to learn the competencies and complete the projects listed below during the six-week grading period of _____.
(dates)

Competencies/Projects:

_____

_____

_____

_____

_____

_____

_____

_____

I further agree that the quality of my completed work must comply with the standards identified for each competency.

I further agree that, upon satisfactory completion of the above, I will receive a final grade of _____ for the stated grading period.
(grade)

_____ _____
Student Date

_____ _____
Instructor Date

Self-Contained Learning Systems

Organization for effective instructional delivery in competency-based education may be achieved through the development of self-contained learning systems, such as those incorporating use of modules or learning activity packages (LAPs). A self-contained learning system for a given Industrial Arts course might contain several packets, each of which is designed for instruction in a group of related competencies. By satisfactorily and successively proceeding through system packets, the student eventually is able to master all task/competencies identified for the course.

The term self-contained, as applied to learning systems, may have either of two meanings. Some systems, or packets within the system, contain all information, directions, and materials needed by the student for completion of system or packet activities. More often, however, packet directions refer the student to the use of additional materials outside of the packets (e.g., texts, audiovisuals, tools and equipment). In the case of the latter, the system remains self-contained in that it includes the procedures for use of all materials, whether they are located within or outside the system itself.

The procedural steps for student completion of self-contained learning system packets are represented by the sequence chart included in this section. The following suggestions are offered for instructors using self-contained learning systems as a means of instructional delivery in the classroom:

> Use or development of self-contained learning systems that include activities centered around the use of printed materials, requiring only that students receive information through

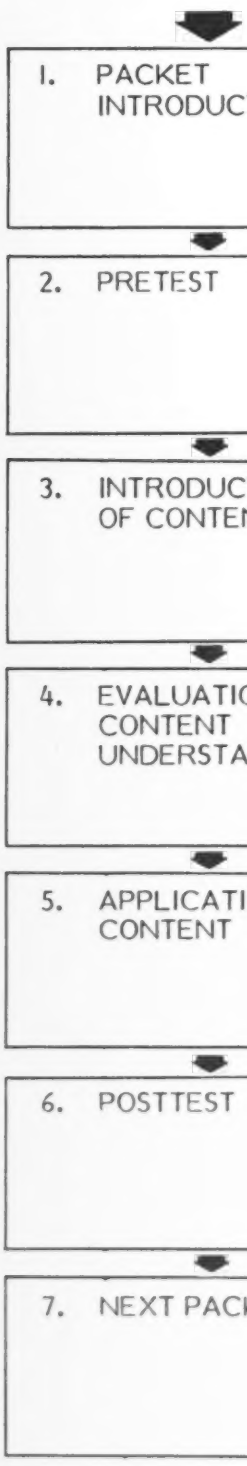
reading and respond through writing, should be avoided. Such materials are most undesirable, both in terms of the limited variation across student activities and the obvious difficulty incurred by students who are not proficient readers or who learn best by other means. The introduction of content (step 3 of the sequence chart) should involve the use of a variety of instructional methods and materials. Group activities and presentation methods should be incorporated for students involved in similar task/competency areas. Because of the amount and type of evaluation involved in self-contained learning systems, means of assessment additional to the pencil-and-paper variety should be employed.

Consistent assignment of self-contained learning system packets for individual and independent student completion should also be avoided. To increase socialization of learning, group activities should be incorporated into the introduction and application of packet content (steps 3 and 5 of the sequence chart). When packets are assigned for independent completion, the student's performance should be monitored frequently in order to assure appropriate application and direction.

Whenever assessment during or at the end of packet completion indicates that review or repetition of content or activities is needed (steps 4, 5, and 6 of sequence chart), it is recommended that this not involve simply the duplication of the initial activity. Needed review may indicate that initial methods or materials were not effective in terms of the individual student. That student may achieve mastery of the same skills through the use of different activities or materials.

SELF-CONTAINED LEARNING SYSTEM SEQUENCE

Student Enters



The student carefully reviews the packet introduction, directions, enabling objectives, and performance objectives.

The student completes the packet pretest. If the established minimum score for mastery is obtained, the student proceeds to the next packet (Step 7); if not, the student proceeds to Step 3 within the same packet.

The instructional content of the packet is introduced to the student. Printed material information may be accompanied by the teacher's presentation of audiovisual materials, or student involvement in supplemental projects or activities.

The student completes a response sheet which assesses his or her mastery of the content introduced in Step 3. If the established minimum score for mastery is obtained, the student proceeds to Step 5; if not, the student reviews content until mastered.

The student completes an activity designed to apply knowledge of content displayed in Step 4. Activities may include research assignments, project completion, or performance of "hands-on" tasks. When specified standards of performance are met, the student proceeds to Step 6.

The student completes the posttest. If the established minimum score for mastery is obtained, the student proceeds to the next packet; if not, Steps 3 through 5 are reviewed until the minimum score is obtained.

Steps 1 through 6 are continued for each successive packet until all system packets have been completed.

SAMPLE LEARNING ACTIVITY PACKAGE

Industrial Arts

Transportation & Society

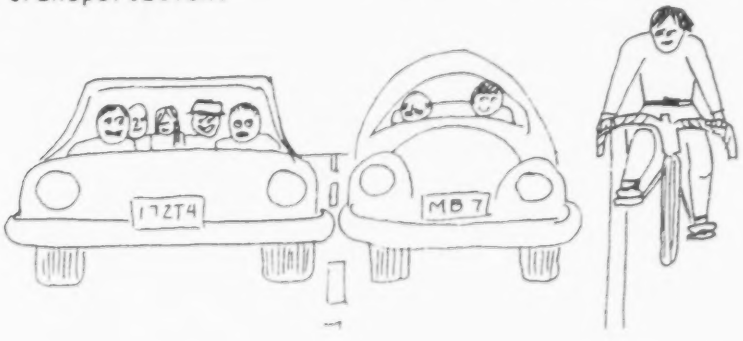
Resources In Technology

Transportation is such a natural part of our daily activities that, like eating and sleeping, it goes almost unnoticed. It is central to everything we do. In high-technology societies, transportation systems use devices such as conveyor belts, pipelines, automobiles, and jet aircraft to move people and goods. Let's explore some of the social impacts of transportation.

After reading this unit, you will be able to:

- Identify three ways our lives have been changed by developments in transportation.
- Describe the importance of transportation in today's society.
- Discuss how transportation has changed social relationships.
- Describe three government agencies that regulate transportation.

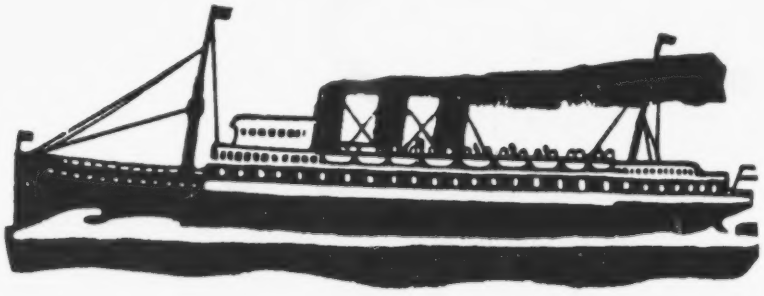
Yes, the new Firebirds and Camaros are hot cars, but are they really useful? What good are they in rough terrain? How much coal can they carry? Sometimes we need more than a fast car. For each aspect of transportation, such as speed, load limits, distance, and cost, there are social effects. The social effects caused by transportation have changed the way we think of ourselves. There are very few items we use, or things we do, that are not affected by transportation.



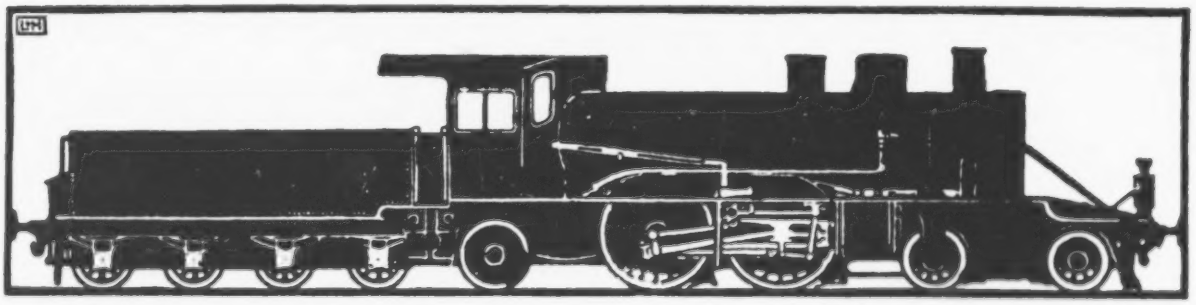
DEVELOPED FOR THE INDUSTRIAL ARTS EDUCATION SERVICE, VIRGINIA DEPARTMENT OF EDUCATION,
BY THE TECHNOLOGY EDUCATION PROGRAM, WEST VIRGINIA UNIVERSITY, MORGANTOWN, WV

Looking Backward

If you had to walk everywhere, you wouldn't get far. Your experience with other people and places would be limited. A major change came many years ago when human beings domesticated animals and used them to carry people and their possessions. This change greatly expanded opportunities for travel and altered the way people lived and governed themselves.



Boats were developed that could carry heavy loads over great distances. Many of the great cities of the world were located on rivers and harbors where large boats could be accommodated. The adoption of the steam engine to propel marine vessels was a major development in transportation during the 1800's. The steam engine increased the reliability of marine transport. Later, the steam engine was adopted to rail transport, and the railroad opened the interior of the country to agricultural development, business, and commerce. New towns and cities and new ways of earning a living came into being.

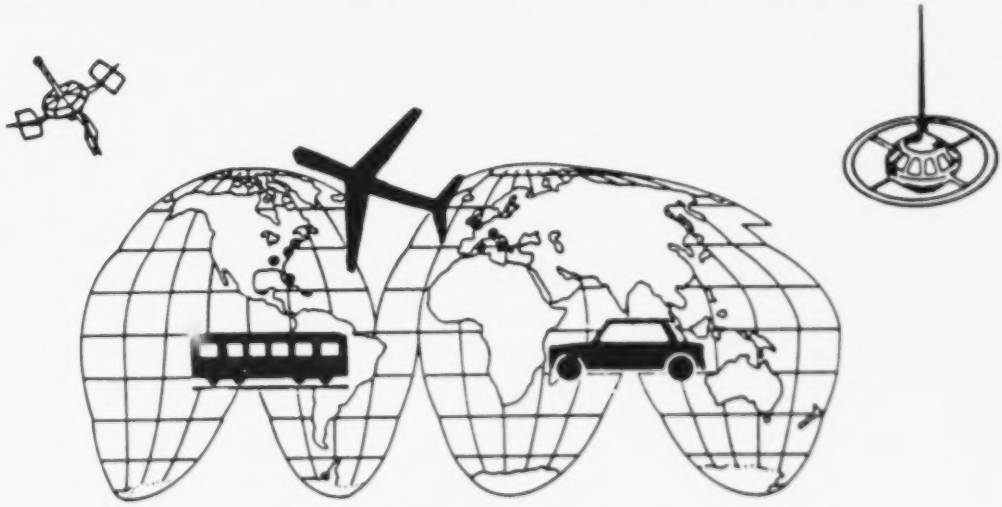


Where would we be without automobiles and trucks? They enable people to live almost any place. Where the terrain is rugged, the airplane and helicopter expand the potential for transporting people and their goods and services to any place on earth. Interplanetary travel began with the landing of human beings on the moon in July of 1969. Again, we have expanded the potential of human beings and altered the way we view ourselves and our future.

Our Interdependent World

Because of modern transportation systems, it is possible to have breakfast at home, lunch in England, view a bicycle race in France, and dinner and a concert in Italy (if one can afford it). We live in an interconnected and interdependent world. Today's trucks, ships, planes, and trains link the resources and products people produce in a worldwide network. Some people in the United States drive cars manufactured in Japan and transported to the U.S. in specially designed ships. The United States ships food worldwide from its agricultural heartland. In turn, we use raw materials shipped in from around the world--industrial diamonds from the Republic of South Africa; manganese from Brazil, Australia, and South Africa; chromium from South Africa, USSR, Turkey, and Zimbabwe; and oil from the Middle East.

Today, we have a modern, worldwide transportation network made possible by high performance diesel and turbine engines, electronic navigation, specialty containers and unit trains, and communication and information systems utilizing satellites and computers. Shopping centers and food stores are stocked daily with products from a world market. Shirts from Hong Kong, cameras from Japan, strawberries and fresh vegetables from California, and paper from Canada are available almost anywhere in the United States.



Social Impacts

The automobile, tour bus, train, and airplane have increased the range of people we contact each day. The auto provides personal freedom for all ages, thereby expanding their social relationships. Dating patterns, family activities, choices of recreation, and personal perceptions of self all have changed. Resources such as food, water, and energy are distributed by a variety of transportation networks. For example, water is piped great distances in the western United States. Where once there was dry, unproductive land, successful farms now prosper. All this has changed where people live, but it also has increased our dependency on technical transportation systems.

Social Controls

In the United States we are free to move goods and people wherever and whenever we wish. Millions of people travel in cars, trains, buses, and airplanes each day. Tons of goods are shipped across the state and national boundaries each day. But with all this freedom of transportation, there are basic social issues such as safety, price, and unfair business practices.

In some cases, laws have been passed or groups have been established by industry to regulate and control transportation in the U.S. For example, the Interstate Commerce Commission (ICC) regulates trucking and the transfer of goods across state lines. The Federal Aviation Administration (FAA) has certain rules to ensure the safety of airline passengers. Vehicles and roadway safety are regulated by the Department of Transportation (DOT). It appears that without some transportation regulations, our individual rights and freedoms might be abused.

SELF QUIZ

Now that you have worked through this, try a SELF QUIZ. On your own sheet of paper, write the answers to these questions.

1. What was the first major breakthrough for humans beings in improving their means of transportation?
2. How has an increasingly interdependent world affected the products we use in our daily lives?
3. What changes have automobiles made in our social relationships?
4. What three federal agencies act to regulate transportation in the United States?

THINGS TO DO

Design a model of an urban mass transit system of the future. Construct both the model city and the transit system from "found" materials (old erector sets, scrap woods, model trains, etc.).

Design a "fantasy" trip anywhere in the world. Use as many modes of travel as possible. Include time tables, route, and cost. Be as detailed as possible. Make use of maps and travel agencies.

FOR FURTHER STUDY

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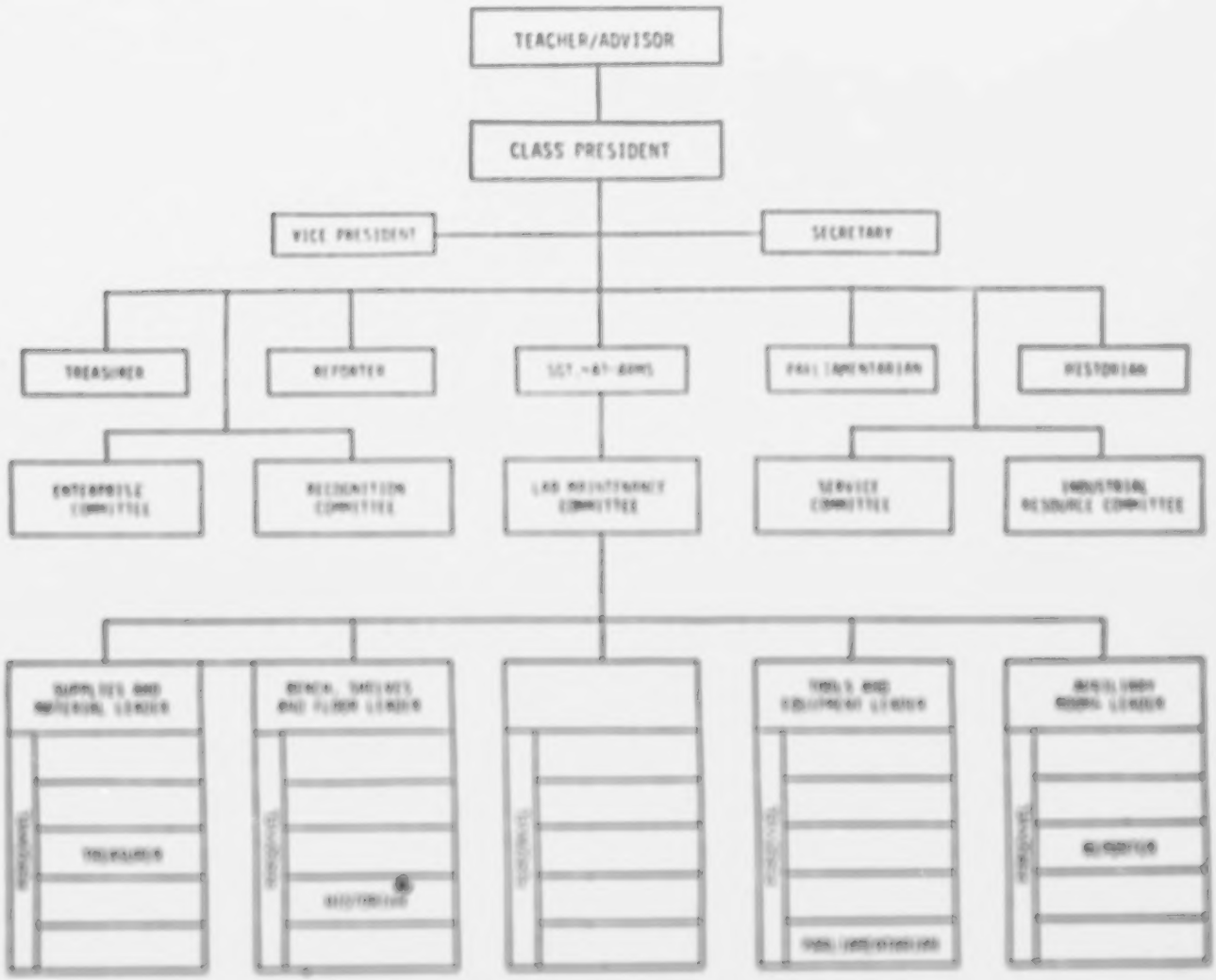
PERSONNEL MANAGEMENT SYSTEM

The organization chart below illustrates a leadership personnel system for Industrial Arts classes. The officers carry out their responsibilities, and committees coordinate the major types of instructional activities, which are part of classroom or laboratory. The teacher may have officers revise this chart to meet the unique class needs, and the chart may be enlarged for classroom display. The duties of officers and committees are suggested on the following pages. Officer assignments to aid in the delivery of competency-based instruction are exemplified by the Historian's duties in retrieving and refiling CBE record forms for the teacher. Teachers who use the officer/committee system for classroom and laboratory management will be involving every student in the class. This type of organization leads to improved skills, increased knowledge, and better attitudes among students, and it contributes to the individual student's ability to function in the class, in other organizations, or in future work. Activities related to AIASA described in Section II of this implementation guide are integrated into every course via the task/competencies.



The Student Association as Personnel System with Uniform Titles

All Industrial Arts courses benefit from a personnel system used to manage the classroom or laboratory activities of students. Personnel management is a function of any organization, whether it be a class of students, corporation of employees, or an association of volunteers. Most Industrial Arts personnel systems differ as to the titles of each position in the system. Using AIASA related titles in the personnel system will both manage the class and give students experience with a group organization.

Officers in a democratic organization are best selected by the members of the group. Thus, the teacher may ask the class to nominate persons for election as key management officers. Teachers using any of the titles on the left are encouraged to utilize the uniform title in the right column.

Current Title	Should Have This Uniform Title
General Manager Lab Supervisor Superintendent Project Director Shop Foreman	PRESIDENT
Manager's Assistant Assistant Supervisor Co-Director Production Manager Assistant Superintendent	VICE PRESIDENT
Roll Keeper Recordkeeper Letterwriter	SECRETARY
Accountant Purchasing Agent Supply Clerk Bookkeeper	TREASURER
Safety Director Attorney or Lawyer Contract Officer Permission Coordinator Inspector	PARLIAMENTARIAN
Clean-up Supervisor	SERGEANT-AT-ARMS
Public Relations Director Advertising Agent Publicity Director	REPORTER
Education Director Final Report Writer Scrapbook Manager Librarian CDE Record-Keeper	HISTORIAN

AIASA PERSONNEL IN-CLASS DUTIES

PRESIDENT (Student's Name)

1. Is leader of personnel system
2. Calls clean-up
3. Conducts class meetings
4. Receives ideas and reports from the class members
5. Suggests any possible lab improvements gained through experience
6. Responsible for the assignment or election of new personnel

VICE PRESIDENT (Student's Name)

1. Is familiar with duties of President
2. Substitutes for President
3. Assists President as second-level manager
4. Helps follow up committee work
5. Helps other officers if absent or behind
6. Makes organizational chart for class

SECRETARY

1. Takes roll, makes slip of those absent for teacher
2. Keeps minutes of classdecisions for reading at next meeting
3. Records list of officersand committee personnel
4. Prepares agenda for seninar or class meetings
5. Sends letters when necssary

TREASURER

1. Takes care of any revenues and expenditures
2. Takes care of supplies
3. Helps teacher order supplies
4. Cleans supply room
5. Serves on Enterprising Committee of class

PARLIAMENTARIAN

1. Is responsible for general safety procedures
2. Posts safety posters and information
3. Files safety test recors
4. Inventories first aid suplies and notifies instructor when additioal supplies are needed
5. Reports any injuries tothe instructor
6. Helps President with motions and rules of class
7. Serves on School/Community Service Committee of class

SERGEANT-AT-ARMS

1. Oversees all cleanup personnel
2. Makes substitutions for absent cleanup personnel
3. Improvises and receives ideas for improving cleanup
4. Reports to President and teacher when the cleanup is completed
5. Prepares room for class meetings
6. May serve as Quality Control or Union Steward

REPORTER

1. Reports to class on theirogress of activities
2. Prepares bulletin boards or displays related activities of school AIAA
3. Writes articles or makes photos for school newspaper
4. Welcomes visitors and explains classwork
5. Cleans darkroom if usable
6. Advertises projects or services of class
7. Serves on Recognition committee of class

HISTORIAN

1. Picks up homework or assignments for teacher
2. Checks off work turned in by class to members
3. Organizes, retrieves, and refiles individual student recording forms for documentation by teacher
4. Keeps notebooks, files, or scrapbook up to date
5. Cleans books and reference area of class
6. Photographs activities
7. Serves on Industrial Resource Committee of class

COMMITTEE DUTIES

LABORATORY MANAGEMENT AND MAINTENANCE COMMITTEE

1. Personnel appointed or rotated to each position by sergeant-at-arms and officers
2. Duties as leader or worker in one of these areas held by all students in class:
   (1) Supplies and reference materials
   (2) Tools, equipment, and machines
   (3) Auxiliary rooms
   (4) Other (determined by teacher)
3. Completion of duties reported by workers to chairperson, leader, or sergeant-at-arms
4. Class dismissed at proper time by president, sergeant-at-arms, or teacher

INDUSTRIAL AND CAREER RESOURCE COMMITTEE

1. Makes list of industrial or career information resources related to course
2. With teacher, selects three helpful to unit of study
3. Reports resources available at class meetings for vote
4. Arranges speakers or visits for class
5. Sends thank-you letters

SERVICE COMMITTEE

1. Makes list of classroom, school, or community service projects related to course
2. With teacher, selects three related to technical unit of study, or lab safety
3. Reviews requests from others for services
4. Reports possible projects at class meetings for vote
5. Organizes class for work to be done
6. Delivers service to appropriate person or group

ENTERPRISE COMMITTEE

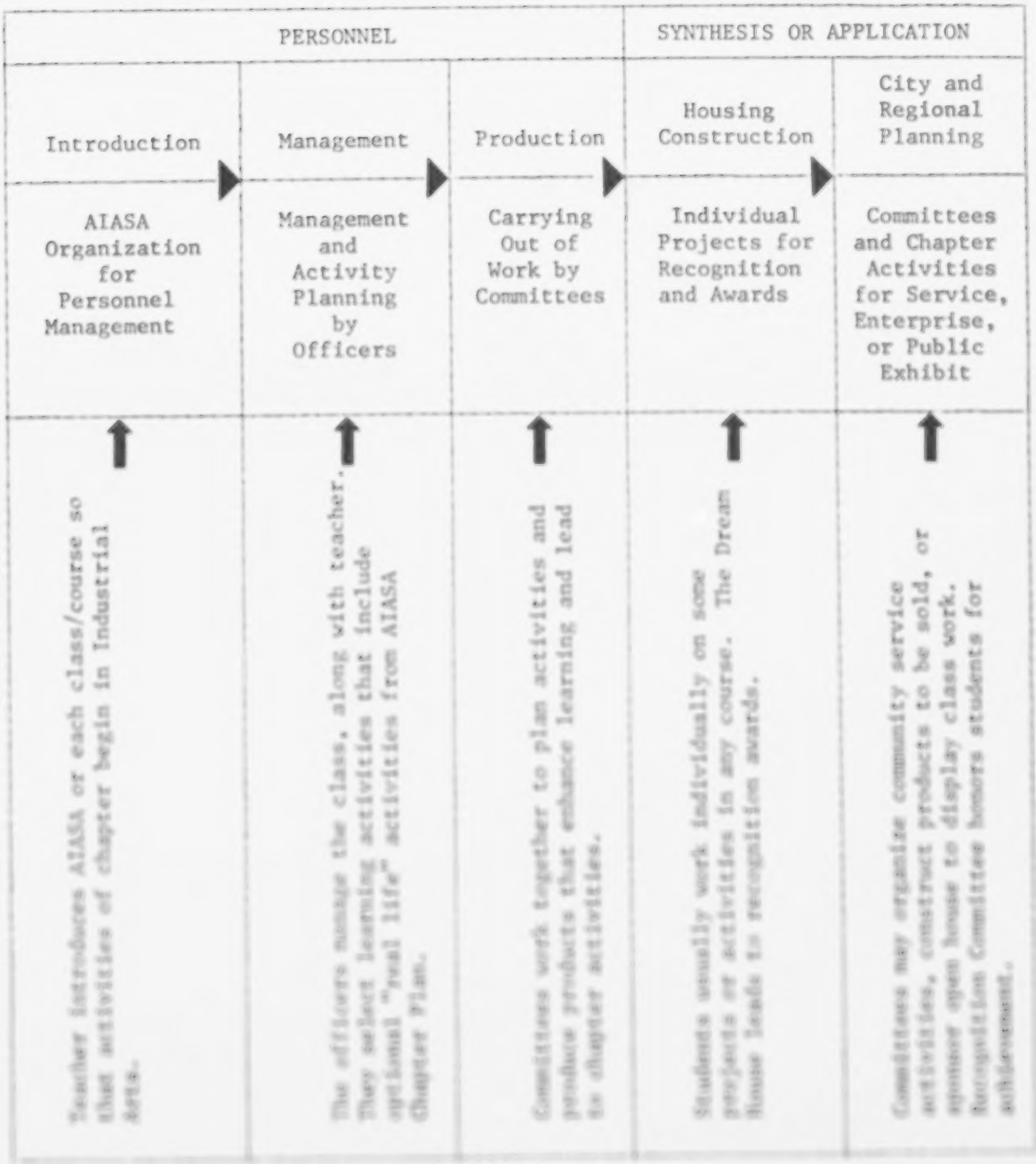
1. Makes list of products or services of economic value related to course
2. Makes prototypes of those related to unit of study
3. Reports possible products or services to class meetings for vote
4. Organizes company for production or service enterprise
5. Keeps financial records and reports to class
6. Presents income for AIASA purposes to Treasurer

RECOGNITION COMMITTEE

1. Makes list of regular AIASA contests and others related to course
2. With teacher, selects or develops contests related to unit of study
3. Reports at class meetings on contests to be used
4. Organizes contest procedures and awards to be given
5. Recognizes winners with awards and newspapers articles

SAMPLE PLAN FOR
INCLUDING AIASA WITHIN A CLASS

A Model Personnel System for Managing Construction (8431)


PERSONNEL
SYNTHESIS OR APPLICATION
Introduction
Management
Production
Housing Construction
City and Regional Planning
AIASA Organization for Personnel Management
Management and Activity Planning by Officers
Carrying Out of Work by Committees
Individual Projects for Recognition and Awards
Committees and Chapter Activities for Service, Enterprise, or Public Exhibit
Teacher introduces AIASA or each class/course so that activities of chapter begin in Industrial Arts.
The officers manage the class, along with teacher. They select learning activities that include optional "real life" activities from AIASA Chapter Plan.
Committees work together to plan activities and produce products that enhance learning and lead to chapter activities.
Students usually work individually on some projects or activities in any course. The Dream House leads to recognition awards.
Committees may organize community service activities, construct products to be sold, or sponsor open house to display class work. Recognition Committee honors students for achievement.

SECTION IV.

RECORDING SYSTEMS

Competency-based vocational education in Virginia requires a system for documenting competencies which have been achieved by each student. This information is essential to the student, teacher, and employer. For the student, it provides a record of successful progress through the vocational program. If the student should transfer to another school or enter the community college system, the record will assist in a smooth transition--eliminating the need to repeat skills and knowledge learned. Therefore, the competency record facilitates articulation between and among vocational programs at different levels of instruction. The teacher uses the competency record for evaluation and planning purposes in the course. Perhaps the most important use of a competency recording system is the provision of specific course information to students prior to and during instruction.

This section contains information on the characteristics of grading and recording systems for competency-based education. This information is followed by sample record forms for use in Industrial Arts programs and courses.

GRADING

Local school boards establish the grading system for their school divisions; therefore, any proposed system in which competency attainment is converted to an overall grade must be based on local requirements. This must be underscored in considering principles of CBE grading.

It is generally agreed that grading each competency should go beyond the pass-fail stage and should include an indication of the degree of skill the student has demonstrated. In addition, the grade may be based on more than just the performance (psychomotor) level and include the knowledge (cognitive) and personal behavior (affective) areas. The time required by a student to reach a specific performance level should not be considered in rating a student.

Grades from any system will, of course, need to be converted to the conventional A, B, C, D, F system for reporting of grades. The grade for each individual competency must, though, be retained in a student file for use by employers, etc.

Passing (or failing) grades for a course can be accomplished in several ways, such as establishing a minimum number of competencies which must be mastered fully, the number of competencies mastered, or averaging of the scores on only those competencies actually mastered.

CHARACTERISTICS OF GRADING SYSTEMS FOR CBE

1. Each student should be graded on his or her own level of achievement and not in comparison to other students.
2. The minimum acceptable level of achievement should be based on the minimum entry level in the industry or trade.
3. The grading system should be based on nonpunitive strategies. Grades for competencies achieved should not be lowered by competencies not achieved.
4. The system should provide recognition for achievement beyond the minimum level.
5. In an articulated program, both secondary and postsecondary instructors must agree on the same criteria or standards to be achieved for each competency.
6. The evaluation system (letter grade, points, etc.) must be related to the competency criteria standard. For example, the terms excellent, good, average for the letter grades A, B, C should not be used.

7. The grading composition (e.g., percentage for attendance, attitude, etc.) must be made known to the student. It is suggested that three grades be given--one for competency achievement, one for attendance/attitudes, and one for knowledge.

8. A minimum number of competencies should be equated to different letter grades. For example, a student receiving an A grade must have achieved 90 percent of the identified competencies.

9. The time required for a student to master a competency should not be considered in rating a student, except as reflected in #8, above.

10. Letter grades should not be placed on competency sheets, but on the official transcript.

11. A point system should be used for all competency-based courses. This allows for a standard grade translation.

PSYCHOMOTOR GRADING

4, 3, 2, 1, 0 System

This system is the most widely used and is recommended since it easily converts to the A, B, C, D, F and decimal systems, A being 4 and F being 0. An average of 3.7 would be a grade of 94.25 percent, etc.

4 - Highly proficient: The student can complete task quickly and accurately, can direct others in how to do task, and needs only normal supervision.

3 - Competent: The student can complete all parts of the task, needs only a spot check of completed work, meets minimum entry level requirements, and needs job-entry supervision.

2 - Partially proficient: The student can complete most parts of the task, needs help only on hardest parts, may not meet all job-entry level requirements for speed and accuracy, and needs close supervision.

1 - Extremely limited: The student can complete simple parts of task, needs to be told or shown how to do most of task, and needs extremely close supervision.

0 - The student cannot perform any part of task at a level sufficient for participation in a work environment.

X - The student did not attempt the task.

GRADING SYSTEM INCLUDING AFFECTIVE, COGNITIVE, AND PSYCHOMOTOR ABILITIES

1. The cognitive grade should be determined from average of tests and quizzes.

2. The affective grade should be determined by considering the following:

   a. Use of correct safety procedures
   b. Good use of time
   c. Punctuality
   d. Ability to follow instructions
   e. Ability to work well with others
   f. Care of tools, equipment, and building
   g. Pride in workmanship
   h. Regular attendance.

3. The psychomotor grade should be determined from a 4, 3, 2, 1 or 5, 4, 3, 2, 1 or similar system.

4. The three grades should be averaged in the following way:

   Psychomotor grade x .5 + affective grade x .25 + cognitive grade x .25 = final grade.

CHARACTERISTICS OF RECORDING SYSTEMS FOR CBE

1. A common recording system should be used at both high school and community college levels.

2. The recording system must be an official school record and should be part of students' permanent files.

3. The recording system must contain a listing of all competencies in the occupational program.

4. A rating system should identify competencies achieved, designate the level of student performance, and provide an interpretation of the rating scale.

5. The record should include as a minimum:

   a. Occupational title
   b. Signatures of student, instructor, and school official
   c. Competency list.

INDIVIDUAL STUDENT RECORD

SAMPLES

The first and second sample forms in this section may be reproduced and used in recording individual student achievement in a given Industrial Arts course. The third sample represents a recording format that can be typed completely by the classroom teacher to save time and paper. The fourth sample is a computerized recording form for adaptation to local computer hardware and management programs.

The following samples are included:

- Vocational Education Competency Record
- Recording System (An Example Suggested by Virginia Industrial Arts Service)
- Format for Typing a Recording Form
- Computerized Student Profile

V O C A T I O N A L E D U C A T I O N
C O M P E T E N C Y R E C O R D

Name of Student _____

School _____

Program Area: _____

Course Title: _____

CIP Code No. _____

VA Course No. _____

CERTIFICATION OF COMPETENCY

I hereby certify that the student named above has achieved the level of proficiency at the time of testing shown for each of the competencies on the attached list and has completed _____ hours of instruction with an attendance rate of _____ percent.

_____
Instructor's Signature

_____
Date

ADDITIONAL COMMENTS:

_____

_____

_____

_____

_____

INTERPRETATION OF SYMBOLS AND STUDENT SCORES

PERFORMANCE LEVEL

Proficiency 4:	HIGHLY PROFICIENT: The student can complete task quickly and accurately, can direct others in how to do the task, and needs normal supervision (94%-100%).
Proficiency 3:	COMPETENT: The student can do all parts of task, meets minimum local demands for speed and accuracy, and needs job entry supervision (87%-93%).
Proficiency 2:	PARTIALLY PROFICIENT: The student can do most parts of task, needs help only on hardest parts, may not meet local demands for speed and accuracy, and needs close supervision (79%-86%).
Proficiency 1:	EXTREMELY LIMITED: The student can do simple part of task, needs to be told/shown how to do most of the task, and needs extremely close supervision (70%-78%).
Proficiency 0:	The student's degree of skill is below minimally acceptable performance level (69% or below).

KNOWLEDGE LEVEL

Knowledge Level A:	OPERATING PROFICIENCY: The student can identify, measure, and use troubleshooting techniques to resolve task-related problems and can evaluate conditions and make proper decisions (94%-100%).
Knowledge Level B:	TECHNIQUES AND PRINCIPLES: The student can explain how and when task must be done and why each step is needed, can interpret written and oral instructions, and can analyze facts/principles (87%-93%).
Knowledge Level C:	PROCEDURES: The student can name most steps in task, needs help interpreting written instructions, and can explain basic facts and state general principles (79%-86%).
Knowledge Level D:	NOMENCLATURE: The student can identify parts and tools, and understand simple facts about task, and can identify related basic facts and terms (70%-78%).
Knowledge Level E:	The student's knowledge is below minimally acceptable standard (69% or below).

WORK HABITS AND ETHICS

Level A:	HIGHLY ACCEPTABLE: This is an area in which extraordinary strength is shown.
Level B:	VERY ACCEPTABLE: This is an area in which more than average strength is shown.
Level C:	ACCEPTABLE: This is an area in which average strength is shown.
Level D:	PARTIALLY ACCEPTABLE: This is an area in which some improvement is needed.
Level E:	NOT ACCEPTABLE: This is an area needing considerable improvement.

Page ____ of ____

Name _____ Program Area _____

Course Title _____

TASK NO.	TASK/COMPETENCY	PERFORMANCE					KNOWLEDGE					DATE
		4	3	2	1	0	a	b	c	d	e	

Page ____ of ____

Name _____ Program Area _____

Course Title _____

NO.	EDUCATION/TECHNICAL KNOWLEDGE/ JOB PHYSICAL PROFILE Examples: 1. Uses instructions furnished in written or oral form 2. Able to use fingers, hands, arms to reach, handle, etc.	PERFORMANCE					KNOWLEDGE				
		4	3	2	1	0	a	b	c	d	e

NO.	WORK HABITS AND ETHICS Examples: 1. Accepts constructive criticism 2. Demonstrates correct safety practices	WORK HABITS AND ETHICS				
		A	B	C	D	E

INDUSTRIAL ARTS EDUCATION SERVICE

COMMONWEALTH OF VIRGINIA

Name_____

Student No._____

School_____

School System_____

Course_____

RATING SCALE

4. PERFORMANCE ABOVE CRITERION
3. PERFORMANCE AT CRITERION
2. PERFORMANCE BELOW CRITERION
1. HAS BASIC KNOWLEDGE
N/A NOT ACHIEVED

Directions: The instructor will signify task/competency achievement by entering the date and signature in the space provided. If the competency cannot be achieved due to circumstances beyond the control of the student, the instructor will enter an "N/A" in place of an achievement date.

CONTENT/CONCEPT	TASK NO.	TASK/COMPETENCY LIST	RATING	ACHIEVEMENT DATE

98

Name_____

Student No._____

Course_____

CONTENT/CONCEPT	TASK NO.	TASK/COMPETENCY LIST	RATING	ACHIEVEMENT DATE

Format For Typing a Recording Form

The recording sheet on the reverse side of this page may be typed on a ditto master and duplicated for documenting the task/competencies achieved by each student. The duplicated forms, with course task/competencies listed, can be distributed to students prior to instruction to show what they are expected to achieve. Forms for each class may be placed alphabetically in a class notebook; as task/competencies are achieved, the corresponding date/rating for each may be documented in the space to the left.

RECORDING FORM

FOR

_____
(Student's Name)

Student's Number _____ Course Title _____

Grade Level _____ Teacher _____

School: _____ Class Period _____

Rating or Date Achieved		Task/Competency List
_____	1.1	Explore wood working occupations
_____	1.2	Identify (establish) management systems
_____	1.3	
_____	1.4	
_____	2.1	
_____	2.2	

etc.

COMPUTERIZED STUDENT PROFILE

The Virginia Peninsula Articulation Project has developed computerized information of a student's progress on the competencies identified by the project.

The system is designed for the teacher to enter the student's rating per competency on a scan sheet to be read by the computer, which keeps a running record of the student's performance. At certain times, reports are prepared by the computer to include:

> STUDENT PROFILE--designed to let the student see, at a glance, how well he or she has done to date on the competencies for the course. This informaton allows the student to know the areas in which he or she needs to work to complete the course.
>
> CLASS PROFILE--designed to let the teacher see, at a glance, the progress of the class on the competencies for the course. This provides the teacher with important information for making teaching decisions and plans.
>
> COURSE PROFILE--designed to let the supervisor see the progress of an entire division on the competencies for a particular course. With this information, the supervisor can make decisions regarding curriculum revision, resources, and materials.

Working together, the seven divisions can articulate a student and course information between themselves and others, using the developed CBE materials. Computer development for this project is being done by Hampton City School System.

The project staff believes that the more that is known about how a student or group of students is performing on the competencies developed, the better able the teacher will be to meet the needs of the student. The computer is seen as a tool to assist the teacher in the tasks of keeping up with student ratings and providing information about how well groups or classes of students are performing. With this type of information available, improvement in serving students is anticipated.

SAMPLE

H

VOCATIONAL EDUCATION STUDENT COMPETENCY SCAN SHEET

STUDENT NAME _____ STUDENT NUMBER _____ COURSE METALS/ MACHINE

SCHOOL HAMPTON GRADE 11 YEAR 80/81 TCHR NAME BAKER

DIVISION 01001120000300

STUDENT NUMBER: 1 0 2 2 6 1 1 1 1

SCHOOL NUMBER: 3 0 0

DIVISION CODE: 1 1 2

COURSE CODE: 8 5 4 8 0 0

TEACHER NUMBER: 1 0 0

EVALUATION CODE

4 - ABOVE CRITERION
3 - AT CRITERION
2 - NEEDS SUPERVISION
1 - CANNOT PERFORM TASK
0 - TASK NOT ATTEMPTED
P - ACCOMPLISHED/PRE-TEST
E - EQUIPMENT/NOT AVAILABLE

4.1		5.12		9.10		10.30													
4.2		6.1		9.11		11.1													
4.3		6.2		9.12		11.2													
4.4		6.3		9.13		11.3													
4.5		6.4		9.14		11.4													
4.6		6.5		9.15		11.5													
4.7		7.1		9.16		11.6													
4.8		7.2		9.17		11.7													
4.9		7.3		9.18		11.8													
4.10		7.4		9.19		11.9													
4.11		7.5		9.20		11.10													
4.12		7.6		10.1		11.11													
4.13		7.7		10.2		11.12													
4.14		8.1		10.3		11.13													
4.15		8.2		10.4		11.14													
4.16		8.3		10.5		11.15													
4.17		8.4		10.6		11.16													
4.18		8.5		10.7		11.17													
4.19		8.6		10.8		11.18													
4.20		8.7		10.9		11.19													
4.21		8.8		10.10		11.20													
4.22		8.9		10.11		11.21													
4.23		8.10		10.12		11.22													
4.24		8.11		10.13		11.23													
4.25		8.12		10.14		11.24													
4.26		8.13		10.15		11.25													
4.27		8.14		10.16		12.1													
4.28		8.15		10.17		12.2													
4.29		8.16		10.18		12.3													
5.1		8.17		10.19		12.4													
5.2		8.18		10.20		12.5													
5.3		9.1		10.21		12.6													
5.4		9.2		10.22		12.7													
5.5		9.3		10.23		12.8													
5.6		9.4		10.24															
5.7		9.5		10.25															
5.8		9.6		10.26															
5.9		9.7		10.27															
5.10		9.8		10.28															
5.11		9.9		10.29															

FORM 847C (R1)

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